



Chief of Naval Operations Energy and Environmental Readiness Division

DIRECTOR

Rear Admiral Kevin R. Slates

DEPUTY DIRECTOR

Mr. Karnig H. Ohannessian

DIRECTOR, COMMUNICATION AND OUTREACH

Kenneth Hess

Currents Staff

MANAGING EDITOR

Bruce McCaffrey Bruce McCaffrey Consulting, Inc. brucemccaffrey@sbcglobal.net 773-376-6200

CONTRIBUTING WRITER

Kathy Kelley

ART DIRECTOR

Victoria Bermel

GRAPHIC ARTIST

Amy Jungers

DISTRIBUTION MANAGER

Lorraine Wass ljwass@outlook.com 207-384-5249



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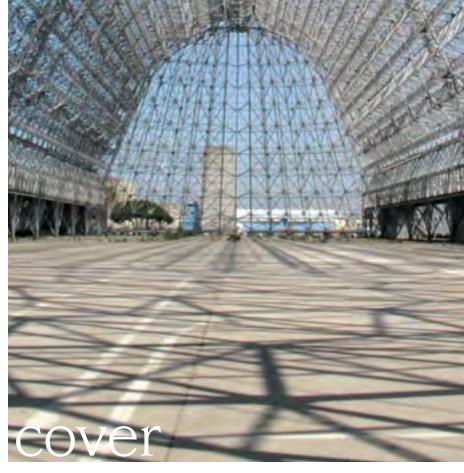


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Twenty-seven winners have been announced for the Fiscal Year 2013 Chief of Naval Operations Environmental Awards competition. Among the award winners is the Naval Facilities Engineering Command Base Realignment and Closure Program Management Office for its efforts to successfully remove contaminated siding and other building materials at the former Moffett Field's Hangar 1—a structure that was constructed in the early 1930's to house the dirigible airship USS Macon (ZRS-5).

Scott Anderson

CNO Recognizes Awards Winners for Exceptional Environmental Stewardship

Laudable Efforts Include the Safe Removal of Contaminated Siding from Dirigible Hangar at Moffett Field

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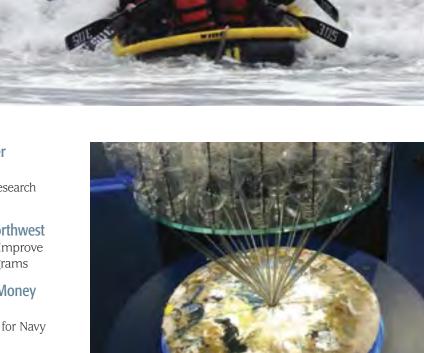
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Accelerating Technologies, Creating Partnerships, & Building Awareness to Support the Warfighter

WELCOME TO THE summer 2014 issue of *Currents*. As blistering heat and humidity strain our climate control systems here in DC and summer storms cause electrical outages across the country, I'm reminded of how fragile our infrastructure can be—and how important it is to reduce vulnerabilities both ashore and at sea while increasing resiliency to support our Chief of Naval Operation's tenants of Warfighting First, Operate Forward, and Be Ready. Vulnerabilities can be as straightforward as not having the fuel where and when you need it, or the shore power to support a critical mission, or as complex as environmental planning challenges that impact our ability to train and test new systems and technologies at sea.

With that broad definition of vulnerability as background, I'll use this space to touch on a recent sea level rise speaking engagement; some energy-related technology and awareness initiatives that are ongoing; a wind turbine agreement; and some of our recent public outreach efforts.

In the realm of infrastructure fragility, I spoke at the TechSurge "Technical Support for Coastal Resiliency" conference in June at Old Dominion University in Norfolk. Naval Station Norfolk is our largest naval base, and by virtue of its location, it's susceptible to sea level rise. To explore solutions, representatives from the White House Council on Environmental Quality, the National Security Council, and other Federal, state and local governments gathered at the event to discuss the encroachment challenges sea level rise could impose on the region. Bottom line: our bases and Sailors of the future can't be under water after every storm. To be successful, we need to work together with communities and across all levels of government to address this challenge and increase our resiliency—no one entity is going to solve this issue alone.

In terms of energy technologies, we're working hard with the Naval Sea Systems Command (NAVSEA) on a plan to accelerate the installation of light emitting diode (LED) bulbs for all surface combatant ships within the next few years, and NAVSEA is aggressively pursuing commercial solutions to increase qualified vendors and drive down cost. Energy efficiency is a consideration here, but the even more important benefits will be less maintenance (because LED bulbs last up to five times longer than fluorescents), better light quality for Sailors, reduced risk for our Sailors from a safety perspective



(because in many locations onboard a ship lights are not a simple item to replace), and reduced hazardous waste disposal. (Mercury is typically present in florescent tubes but not in LED bulbs.) Various other technologies (including networked thermostats, bow bulbs to improve ship hydrodynamics, variable speed pumps and motors, and stern flaps) are also being integrated on more ships in the not-too-distant future.

We partnered with Navy and Marine Corps commands to host a very successful Naval Energy Pavilion at the Sea-Air-Space (SAS) exposition at National Harbor, MD in April. The exhibit featured videos, a 3D printer, expeditionary equipment (e.g., ruggedized photovoltaic and water filtration gear), an electric car, scale models of energy efficient shipboard systems, and other hardware to help inform attendees about some of the energy-related technologies and culture change concepts we're exploring. During the event, I hosted four industry roundtable sessions (maritime, aviation, expeditionary, and shore) to discuss energy challenges and opportunities in each of those areas that we face. SAS was a great opportunity to connect with government, industry, academia, and technical experts and share our message with interested stakeholders.

In line with our energy culture change efforts, we're presently ramping up our involvement in a "social business" initiative as part of MilSuite (https://www.milsuite.mil). Our intent is to leverage MilSuite to create virtual communities, share ideas, and comment on documents and concepts in a collaborative work environment to promote the concept that many minds together yield more innovative solutions than individual ideas. The site,

which is accessible via Common Access Card, is gaining popularity among Navy Sailors, civilians, and contractors worldwide. MilSuite groups host topical conversations and work on issues in discussions and blogs that capture the insight of those making warfighter missions succeed. To quote Vice Admiral Cullom (Deputy Chief of Naval Operations for Fleet Readiness and Logistics), 'Social business promotes and captures the wisdom of the crowd.' I too am a big believer in collaborating on ideas, because the end result is often better than an idea any of us could have thought of independently.

We are also launching new elements of our "Energy Warrior" awareness campaign, including promotional videos and a tablet-device application that promote the importance of energy—both ashore and afloat—to enable combat capability. The campaign is intended to motivate Sailors to change how they view and use energy and encourage them to download the Energy Warrior app. Be on the lookout for the first edition entitled "Disrupt the Future," which will be available on iTunes and in Android format. We're trying to create a robust online destination for innovative people, ideas, and technology that will help drive the Navy toward energy resiliency. Our vision is to evolve the product from a digital publication series into a "collaborative reality platform." We believe this can be a foundation for group problem solving and cross-disciplinary team building.

In compatibility-related news, we recently reached an agreement with E.ON Climate and Renewables (EC&R) Development, LLC to relocate proposed wind turbines near Naval Weapons Systems Training Facility Boardman in Oregon. Turbines were originally proposed within a military aviation route used for low-altitude training, and would have presented an obstruction to our pilots. The memorandum of agreement was signed April 25 by officials from the Department of Defense, the Department of the Navy, and EC&R, and will help us avoid adverse impacts on critical flight training and testing. By working together early in the planning phase, we were able to create a situation that allows for the development of renewable energy without impact to our ability to train.

Due to sequestration, many outreach events were cancelled in 2013, including fleet weeks, air shows, and Navy Weeks. This seriously limited opportunities to engage with the public and share information about our mission and programs—which of course creates a vulnerability for us because of the knowledge gap that many

Americans have about what we do and why it's important. Luckily, outreach events have returned for 2014, and my office has been working closely with the Fleets, System Commands, and regions to ensure that the Navy's energy and environmental programs are highlighted at key events this year. We supported New York Fleet Week (21–26 May) and Portland, Oregon Fleet Week (5–8 June) with energy/environmental exhibits this summer, and plan to have a similar presence at select events this fall. Additionally, U.S. Fleet Forces Command (USFF) has stood up a "Stewards of the Sea" Facebook page to highlight the Navy's commitment to environmental stewardship and the importance of energy. If you haven't seen it, please visit the site at www.facebook.com/USNavyStewardsoftheSea.

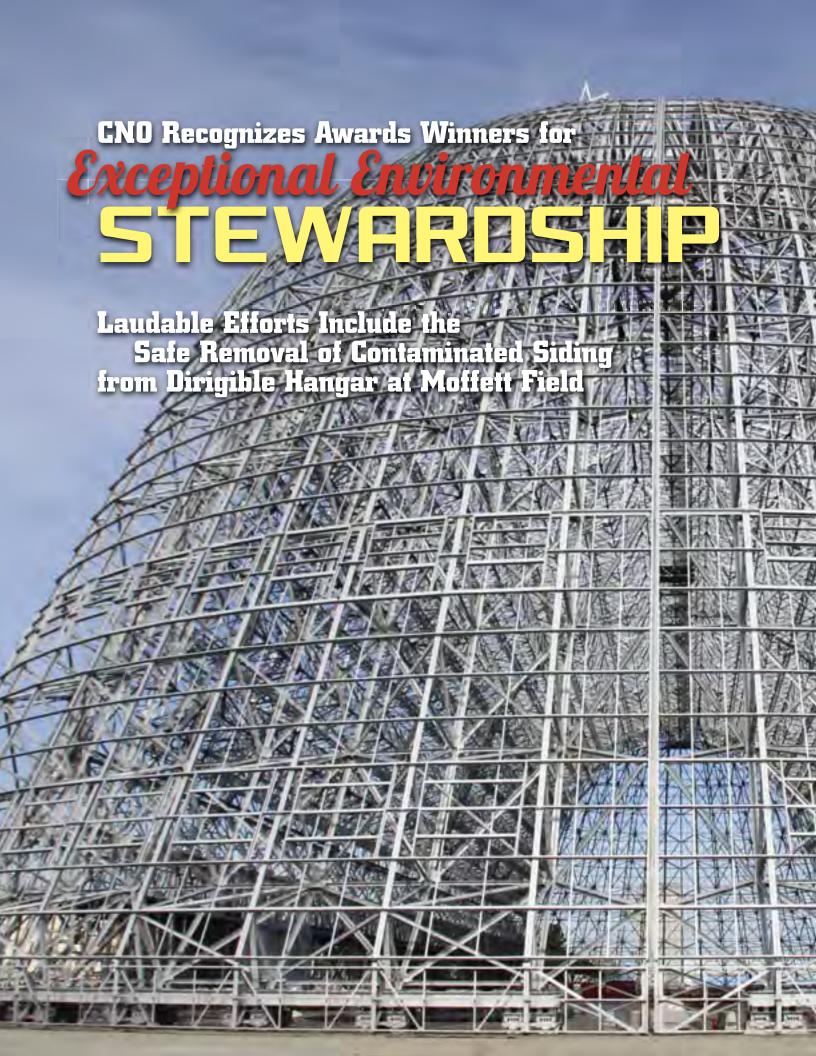
Another great outreach initiative is the "Stewards of the Sea" exhibit, located at the Nauticus Museum which I recently toured. I was thoroughly impressed—the creative team did a tremendous job. The 1,000-square-foot exhibit explores how the Navy protects marine life and safely manages our waste stream at sea while fulfilling our mission. The exhibit was created through a partnership with USFF and the Hampton Roads Naval Museum. Details about the ribbon cutting for the exhibit can be found on page 36 of this issue.

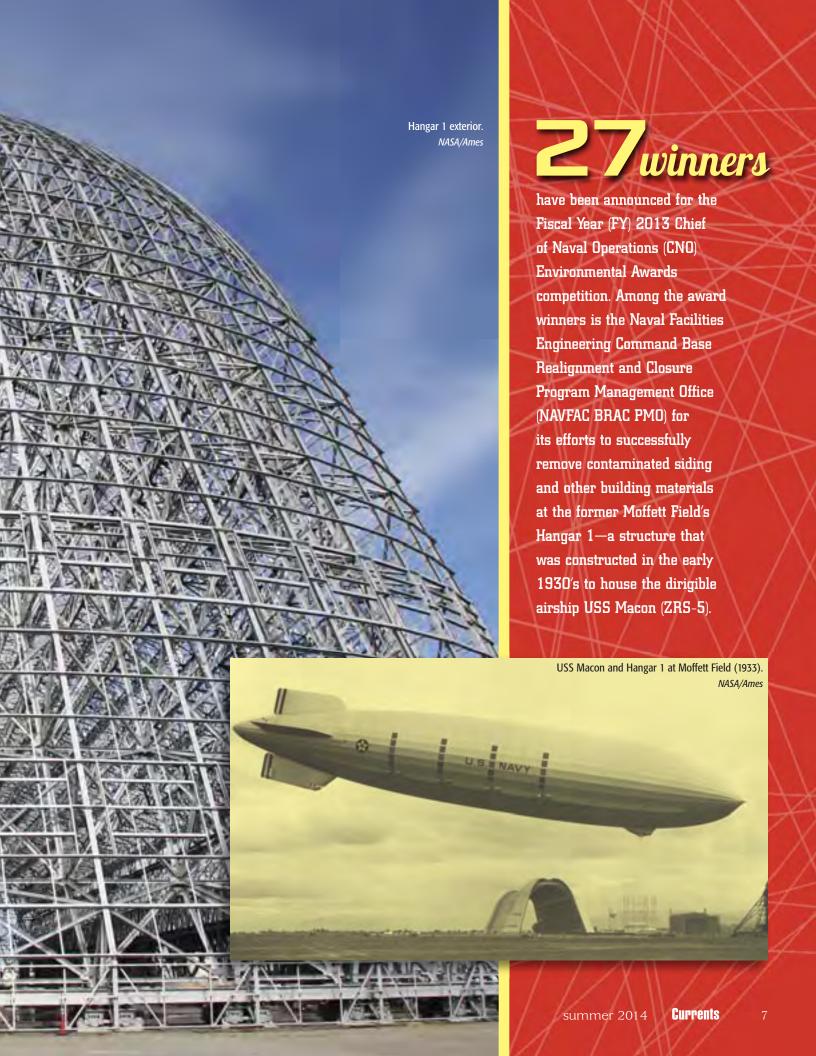
Finally, I want to take a moment to recognize the winners of the fiscal year 2013 Chief of Naval Operations Environmental Awards. Congratulations to each installation, ship, team and individual for your accomplishments. You're setting a superb example for how we can protect the environment and complete the mission. Winners are highlighted on page 6.

The vulnerability connection with energy and the environment seems obvious to me: if we continue our outstanding environmental stewardship and seek and deploy innovative energy technologies and practices that increase our range and time untethered from refueling, we increase our capability and ability to operate forward, which is what the Navy is all about: being where it matters, when it matters.

One effective way to decrease vulnerability is through being well informed. In that regard, thanks for reading *Currents*, and for your continued interest in and support of the Navy's energy and environmental initiatives.

Rear Admiral Kevin R. Slates
Director, Chief of Naval Operations Energy and
Environmental Readiness Division







to the fiscal year 2013 CNO Environmental Award winners and to all who participated in noteworthy efforts promoting environmental stewardship," said Vice Admiral Phil Cullom, deputy chief of naval operations for fleet readiness and logistics. "I applaud all of the nominees for your exceptional dedication to protecting the environment and preserving resources in support of our Navy mission."

For the FY 2013 competition, Navy commands from around the globe submitted nominations for consideration in 10 award categories:

- 1. Environmental restoration (installation)
- 2. Environmental restoration (individual/team)
- 3. Natural resources conservation (small installation)
- 4. Natural resources conservation (individual/team)
- 5. Environmental quality (non-industrial installation)
- 6. Environmental quality (individual/team)
- 7. Environmental quality (large ship)
- 8. Sustainability (industrial installation)

- 9. Cultural resources management (installation)
- 10. Environmental excellence in weapon system acquisition, large program (individual/team)

Subject matter experts from the Navy and non-government organizations judged the nominations on accomplishments from October 1, 2011 through September 30, 2013. Accomplishments of the FY 2013 CNO environmental award winners are highlighted below.

Enuironmental Restoration

These awards recognize efforts to protect human health and the environment by cleaning up identified Department of Defense (DoD) sites in a timely, cost-efficient, and responsive manner. Nominations may be from the Military Departments or Defense Agencies for any U.S. Military active or closing installation worldwide and any individual or team.

Installation

Former Naval Air Station Moffett Field, California

The mission of the NAVFAC BRAC PMO is to provide the services necessary to realign, close and dispose of Navy

These extremely complex environmental projects were independently challenging but uniquely connected.

and Marine Corps BRAC properties. Such realignments and closures provide cost savings that can be reapplied to support Navy and DoD programs.

Under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), two significant projects were completed in 2013 at the former Naval Air Station Moffett Field (Moffett). The NAVFAC BRAC PMO Environmental Restoration (ER) Team completed a Removal Action to remove contaminated siding and other building materials at Site 29 (Hangar 1) as well as a Remedial Action for contaminated sediments in an active stormwater retention pond (Site 25). As described below, these extremely complex environmental projects were independently challenging but uniquely connected.

Moffett is located in Santa Clara County, California approximately ten miles north of San Jose. The population of Santa Clara County is approximately 1.8 million, and is home to "Silicon Valley"—host to some of the largest high

> The Hangar 1 removal action required the removal and disposal of over 4,940,000 pounds of toxic siding and waste materials.







tech firms in the world. The local residents are particularly concerned about regional and base wide environmental protection issues and are active Restoration Advisory Board (RAB) participants.

Environmental restoration activities began at Moffett in 1983 as part of the Navy's Installation Restoration Program. In 1987, the U.S. Environmental Protection Agency (EPA) placed Moffett on the National Priorities List. In 1992, Moffett was designated for closure under the BRAC program. The National Aeronautics and Space Administration (NASA), which already operated the Ames Research Center on the northern side of the base, assumed control of the facility in July 1994 and currently is the federal property owner for Moffett. The Navy conducts environmental investigation and restoration activities at Moffett in accordance with a Federal Facilities Agreement (FFA).

The Navy, as lead agency responsible for environmental actions included in the FFA, created two groups to facilitate the base transfer process—the BRAC Clean-up Team (BCT) and RAB. The BCT consists of members of the Navy and regulatory agencies which include the EPA, the State

of California San Francisco Bay Regional Water Quality Control Board, and NASA Ames representatives and serves to streamline communication of technical issues during site remediation and closure. The RAB consists of the BCT, the Cities of Mountain View and Sunnyvale, and local community members with the purpose of facilitating communication on the Navy's remediation progress and as a forum for community concerns and suggestions.

Moffett's Hangar 1 is a massive structure that was constructed in the early 1930's to house the dirigible airship USS Macon. It is one of the world's largest free-standing structures, covering over eight acres. Hangar 1 measures 1,133 feet long (over three football fields), 308 feet wide, and 198 feet high (approximately 18 stories). The hangar is regarded as a notable visual structure and cultural icon in the San Francisco Bay area. It is a recognized Historic Civil Engineering Landmark, individually listed on the National Register of Historic Places (NRHP), and is a contributing element to the NRHP-listed "Moffett Field Historic District." The siding of Hangar 1 was comprised of Robertson Protected Metal (also known as "Galbestos") and consisted of numerous layers containing polychlorinated biphenyls (PCB), lead, and asbestos. In an

Due to *weathering* and overall siding deterioration, a variety of PCBs were *leaching* from Hangar 1 into the storm drain system.

effort to determine the source of PCB contamination at Site 25, forensic sampling of the storm drain lines was conducted. Results indicated that due to weathering and overall siding deterioration, a variety of PCBs were leaching from Hangar 1 into the storm drain system.

Since 1953, a 230-acre stormwater retention pond (SWRP) and associated diked marsh have been operated at Moffett. In 1991, a settling basin was constructed to control stormwater from the western portion of Moffett (including Hangar 1) in an effort to limit sediment transport into the SWRP/diked marsh (currently identified as Site 25). The western portion of Site 25 is owned by the Midpeninsula Regional Open Space District and the central and northeastern portions are owned by NASA.

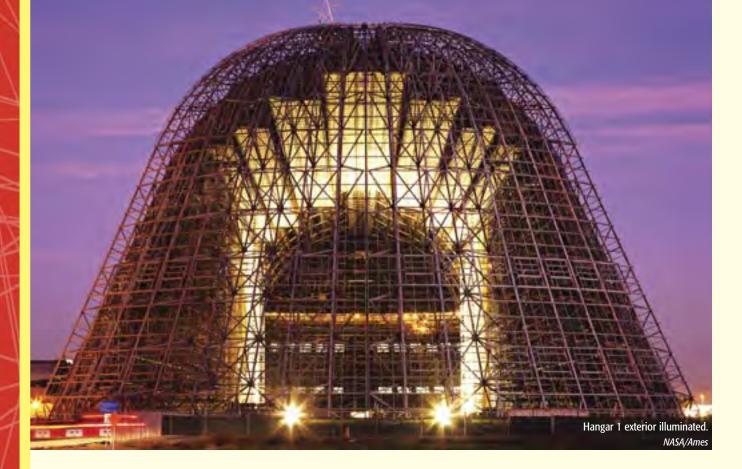
Hangar 1 interior. Hangar 1 is one of the largest freestanding structures in the world, encompassing over eight acres and measuring 1,333 feet long (over three football fields), 308 feet wide, and 198 feet high (approximately 18 stories).

NASA/Ames









Historical sampling of Site 25 sediments identified concentrations of total PCBs, lead, zinc, and total dichlorodiphenyltrichloroethane (DDT) as chemicals of ecological concern (COEC). In 1997, during a routine cleanout of the settling basin, a relatively uncommon PCB (Aroclor-1268) was discovered in sediment in the settling basin and SWRP. Navy and EPA policy for sediment clean-up requires that sources of sediment contamination be identified and controlled prior to initiating cleanup. Consequently, the remedial action for Site 25 could not occur until the source was identified.

In an effort to remove the main source of contamination affecting the down-gradient Site 25 and also to protect human health and the environment, the Navy mitigated contamination at Hangar 1 by performing a Non-Time Critical Removal Action (NTCRA) under CERCLA. The Navy evaluated thirteen removal action alternatives in its 2008 Engineering Evaluation/Cost Analysis (EE/CA). The selected alternative was documented in the Action Memorandum on December 31, 2008. The selected remedy involved:

- 1. Removal of the PCB-contaminated metal siding and redwood roofing material
- 2. Disposal of all debris to appropriate off-site disposal or recycling facilities
- 3. Application of a weather-resistant epoxy coating on the remaining structural steel

- 4. Decontamination of the concrete slab
- 5. Implementation of historic mitigation measures

The siding was removed and disposed as a hazardous waste because the EE/CA determined that other alternatives were either not technically feasible or were not permanent and would require long-term maintenance. The structural steel frame was originally coated with paint that contained concentrations of PCBs and lead. Therefore, the application of an epoxy mastic coating was required to encapsulate the residual contaminants on the steel. This approach along with the implementation of historic mitigation measures, allows NASA to eventually install new siding and return the hangar to a new beneficial mission.

The Moffett ER Team focused on protecting human health during the NTCRA. In particular, NASA tenants and the surrounding community were guarded from potentially contaminated air and dust emissions by controlling the release of contamination from the 4,940,000 pounds of contaminated siding and waste materials that were removed, while also preserving the structural integrity of this historic building. The remedy protected the environment from additional releases of PCB contamination to the stormwater system while also reducing contaminant sources and complying with historic property requirements.

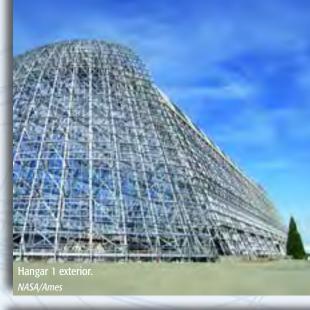
The concept of removing contaminated siding and roofing materials, and demolishing interior structures at Hangar 1

The Moffett ER Team *removed* chemicals of ecological concern in sediment from more than 31 acres and *restored* the 230-acre stormwater retention pond to tidal marsh habitat.

was a controversial topic. While the BCT agreed with the remedy approach, the community, NASA, and most RAB members were initially opposed to the removal action alternatives for Hangar 1, specifically siding removal that would impact its historic and visual aesthetic. By keeping in constant communication to identify issues and concerns, the Navy was able to involve stakeholders in the decision-making, and conduct effective outreach to mitigate the community's reservations about the preferred alternatives. The recommended alternative contained several historic mitigation measures that addressed many of the public's concerns and ultimately allowed for the re-use of Hangar 1 by NASA.

At Site 25, the contaminant levels in the sediment posed an ecological risk to numerous sensitive site receptors. To protect the environment, the Moffett ER Team implemented a remedial action under CERCLA to remove COECs in sediment from more than 31 acres and restore the 230-acre SWRP to tidal marsh habitat. The Moffett ER Team completed a Remedial Investigation and evaluated eight alternatives in a Feasibility Study that considered current and future land use scenarios. The selected remedy was documented in a Record of Decision signed in 2010 by project stakeholders and included the excavation and off-site disposal, treatment of sediment to facilitate disposal, and focused restoration of wetland excavations and ecological monitoring. By successfully negotiating with the regulatory agencies, the team was able to use the innovative Theissen polygon method to identify removal areas. Using this method resulted in the identification and excavation of 113 polygons that ranged in size from less than 500 square feet to two acres. Since these polygons were characterized prior to the excavation effort, this allowed the sediments to be directly loaded from the excavators to the transport vehicles, and then hauled directly to the off-site disposal facility. At completion, the remedial action removed over 36,048 cubic yards of contaminated sediment from a saturated and routinely inundated environment, and restored nearly 20 acres of salt marsh and transitional upland habitat. Based on confirmation sampling, no contaminants remain at the site above project action levels and the site is now available for unrestricted use.

A portion of Site 25 is accessible to the public via the San Francisco Bay Trail. This trail is a popular destination for bicyclists, hikers, birdwatchers, and duck hunters in the neighboring U.S. Fish and Wildlife Service (USFWS) Don Edwards Wildlife refuge. The public access trail provides views of Site 25





At Site 25, early planning allowed the Navy to utilize an innovative approach to identify removal areas.

Henry Ng

and the wildlife located in both the tidal and non-tidal wetlands. Remediation activities at Site 25 required periodic restrictions of access to the Bay Trail. These restrictions were communicated to the public by posting signage and by providing information to stakeholder web sites, including the Association of Bay Area Governments, the City of Mountain View, Friends of Stevens Creek, the Silicon Valley Bicycle Coalition, and USFWS. The high level of communication and interaction provided by the Moffett ER team was instrumental in not only gaining regulatory acceptance at Site 25, but also minimizing impacts to public access of the Bay Trail.

Hunters Point Naval Shipyard, California

The Hunters Point Naval Shipyard (HPNS) installation achieved significant progress in reducing environmental risks and efficiently preparing the property for transfer through a combination of treatability studies, removal actions, and remedial actions. Disposal practices, spills, and releases from past shipyard operations resulted in numerous environmental issues. A challenge of this cleanup area is its massive size, at more than 860 acres as well as the presence of multiple contaminants in various media. In 2013, over 32,000 feet of piping was tested and disposed of; 56,000 cubic yards of soil was excavated; and 28 buildings and sites were remediated. The HPNS cleanup team has worked diligently to keep the community engaged and involved in the cleanup. Through teamwork with the community, over 60 local small businesses participated in the HPNS environmental cleanup, resulting in over \$15 million in awards to local businesses during FY 2012 and FY 2013.



The oldest portion of the shipyard is a 73-acre parcel that has been used almost exclusively for industrial purposes since the late 1800s and is contaminated with multiple toxins. The remedial action is extensive, consisting of soil excavation and offsite disposal, soil vapor extraction, durable covers, zero-valent iron or other biological substrate, monitored natural attenuation, and institutional controls. In FY 2013, the team accomplished over 17,300 cubic yards in excavation (78 percent of the total volume) in a three-month period. *Ulrika Messer*

Naval Air Station Meridian, Mississippi

The primary objective of the Naval Air Station (NAS) Meridian installation restoration program is to manage environmental sites to protect human health and the environment while demonstrating leadership utilizing cost-effective and sustainable methods. The team met or exceeded all of the goals set forth in October 2010. This included the removal of the entire landfill, where 9,000 cubic yards of onsite soil was tested, cleaned, and re-used as backfill—saving the project \$700,000; the preservation of a stand of long-leaf pine; the demolition of the old test cell; and a new jet engine testing facility which is now built and currently operational.



At a metals landfill, a sorter segregates small metal debris from on-site soils. Most of the small scrap was recycled, while the soil was tested and used as fill on site to reduce costs and the carbon emissions of mining and transport of new materials.

Individual or Team

Joint Expeditionary Base Little Creek— Fort Story, Virginia

Achievements of Joint Expeditionary Base Little Creek—Fort Story (JEBLCFS) include reaching "no further action" status for one cleanup site; establishing remedy-in-place for two sites, completion of action decision documents for two sites, and implementation of land use controls for two sites. The team accelerated environmental cleanup and is on track to achieve the completion of the facility construction approximately 18 months ahead of the Navy's FY 2015 goal.

The team successfully collaborated and evaluated the needs of the community, the Navy Environmental Restoration Program, and the mission, and applied economical, environmentally sound, and sustainable methodologies issues under examination. These efforts have resulted in over two million dollars in cost savings and have made approximately 103 acres available for reuse.

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Following dredging during the removal actions at Installation Restoration Solid Waste Management Units 3 and 7b, clean sand was placed on the sediment surface. Sand was placed to address residual contamination and promote the natural establishment of a benthic macro-invertebrate community.

Jeremy Scott

Naval Air Station Cecil Field, Florida (Base Realignment and Closure Cleanup Team)

As of December 2013, 14 Installation Restoration sites have been approved for No Further Action, 99 percent of the 17,225 acres have been transferred, and remedies are in place for all sites in accordance with CERCLA and the Florida Department of Environmental Protection's Petroleum Program. The Cecil Field BRAC Cleanup Team coordinated with the Restoration Advisory Board and teamed with experts to devise and use innovative solutions and technologies to achieve its mission of property transfer while adhering to its vision of partnering.

Since the transfer of property, the City of Jacksonville and Jacksonville Aviation Authority (JAA) have begun improving and developing the property. The redevelopment has included utility upgrades, building demolition and renovation, improvement and expansion of existing hangars and significant development of new hangars, roadway construction/realignment, Lake Fretwell expansion, construction of an Equestrian Center and Recreation Complex, and construction of a Florida Community College of Jacksonville campus.



This solar-powered air sparging system was chosen by the Cecil Field BRAC Cleanup Team for a pilot study at Site 3 to act as a sustainable solution for a cut-off wall to prevent groundwater contamination from discharging into the nearby creek. The system began operation in November 2012 with run times based on the season and amount of available sunlight.

Naval Air Station Jacksonville, Florida (Environmental Restoration Partnering Team)

NAS Jacksonville developed an innovative prioritization protocol for evaluating vapor intrusion (VI) into industrial workspaces in lieu of a more traditional site-wide, building-by-building investigation method. The approach reduced the number of buildings investigated from 167 to 12 at a potential cost savings ranging from \$30,000 to \$60,000 per building.

The use of portable chemical identification system, gas chromatography/mass spectrometry units enabled the field team to identify VI source areas beneath the building slabs in real time, minimizing disruption and reducing cost associated with planning, sampling, analyzing, and reporting on the order of \$10,000 to \$20,000. In total, use of these innovative technologies saved approximately \$250,000 on the VI assessment at Operable Unit Three compared to using traditional building-by-building VI sampling and investigation methods. The NAS Jacksonville team's success is the result of numerous effective partnerships including a project to implement an innovative high-resolution sampling strategy and a fate and transport modeling study to evaluate the impacts of cont-

amination stored in low permeability layers and the effects of "back-diffusion" on long-term groundwater quality sponsored by the Environmental Security Technology Certification Program.



Long-duration passive samplers enabled the NAS Jacksonville Environmental Restoration Partnering Team to perform a comparative study for future applicability. Long-duration sampling reduces uncertainties associated with temporal variability and can simplify deployment of samplers.

CH2M Hill

Natural Resources Conservation

These awards recognize efforts that promote the conservation of natural resources. This includes the identification, protection, and restoration of biological resources and habitats; long-term management and use of the land and its resources; and the promotion of the conservation ethic.

Small Installation

Naval Base Point Loma, California

The most successful natural resources conservation accomplishments of Naval Base Point Loma (NBPL) are in adaptive ecosystem management and marine resources management. By partnering with Point Loma Ecological Conservation Area (PLECA) members, the Point Loma peninsula is managed as one ecosystem under multiple individual property boundaries. This management approach ensures long-term habitat viability and enhancement. Adaptive ecosystem management also increases efficiency through collaboration and shared management and financial responsibilities among PLECA members.



Indigo bunting captured and banded during annual Monitoring Avian Productivity and Survivorship surveys. These surveys were developed under NBPL's Integrated Natural Resources Management Plan.

Andy Wastell

Pacific Missile Range Facility, Hawaii

The Pacific Missile Range Facility (PMRF) protects natural habitat for a variety of endangered, threatened and endemic species that, in return, provides an unparalleled and accessible outdoor laboratory for academic research in a host of areas.

PMRF's involvement in projects and programs have resulted in new accomplishments including:

- 1. Zero bird fatalities during the 2013 migration season—the first time in over 10 years
- 2. An expansion of protected lands for the Laysan Albatross Surrogate Parenting Program
- 3. Analysis of non-viable Laysan albatross eggs
- 4. A shoreline survey to study erosion and accretion along Barking Sands coastline
- 5. Support of a research study for the restoration of a marine snail known as "opihi"

Dr. Lindsay Young,
Pacific Rim
Conservation Biologist,
places a "good" egg
donated from PMRF
under a nesting adult
Laysan albatross
according to the "Egg
Swap" protocol at Na
Aina Kai Botanical



Garden's protected albatross nesting area.

Stefan Alford

Individual or Team

Mr. Gary Cottle and Ms. Anna Keyzers, Naval Air Station Fallon, Nevada

Mr. Cottle and Ms. Keyzers work in the Natural Resources (NR) branch of the Public Works Environmental Division and manage the lands at Naval Air Station Fallon. The air station occupies approximately 241,000 acres in Churchill County, Nevada; the main station consists of 8,670 acres surrounded by 3,000 acres in the Agriculture Outlease Program; and 3,865 acres of rangeland vegetation. The remaining area is the Fallon Range Training Complex (FRTC), which features four noncontiguous air-to-ground training ranges and an electronic warfare range.

The NR team has successfully enhanced the ecosystem at the distinctively isolated Dixie Valley while controlling invasive species. They also enhanced bird and bat habitat protection in two training ranges by closing ten abandoned mines with custom bat-compatible designed gates to help protect their habitat from human intrusion; and removed over 30 PVC pipes to stop birds from getting trapped.

over 30 PVC pipes to stop birds from getting trapped.

Custom made gates were added to 10 abandoned mine openings, allowing bats continued access while preventing unsafe access to people. Anna Keyzers

Mrs. Michael Wright, Naval Air Station Oceana, Virginia

Mrs. Wright is a Natural Resources Specialist who oversees the management and implementation of three Integrated Natural Resources Management Plans covering four primary naval properties. She provides direct leadership to the region's conservation law enforcement officer, a biological science technician, several student hires, and volunteers. As part of her duties, she is a U.S. DoD Partners in Flight representative, where she reviews and provides feedback on all DoD Legacy Project proposals related to birds.

One of Mrs. Wright's many accomplishments was to help organize over 150 volunteers to assist with habitat restoration activities, including shore infrastructure protection, at Naval Air Station Oceana (NASO) Dam Neck Annex. During multiple dune restoration events, volunteers, Cooperative Ecosystem Studies Units partners, and natural resources team members planted over 60,000 plants by hand, installed over two miles of dune fencing, and recycled over 2,500 Christmas trees. In FY 2012, Mrs. Wright obtained funding for and coordinated the award or implementation of over 38 natural resources projects, obligating \$1.8M dollars; and in FY 2013 she awarded or implemented 41 projects, obligating over \$460,000.



Mrs. Wright holding an Endangered Kemps ridley sea turtle hatchling, found during the excavation of a nest after the nest had successfully hatched. Mrs. Wright and a number of volunteers in coordination with state and local agencies released the sea turtle later that evening and watched it successfully make its way into the ocean.

Naval Support Activity Monterey, California (Natural Resources Conservation Team)

Naval Support Activity (NSA) Monterey borders the Monterey Bay National Marine Sanctuary. As stewards of four federally threatened or endangered species and several rare ecosystems, the NSA Monterey Natural Resources Conservation Team (NRCT) has the immense responsibility of balancing one of the world's most ecologically diverse areas with growing mission demands and community encroachment.

NSA Monterey's many accomplishments include:

- Protecting three federally listed endangered plant species by removing invasive plants and developing interpretive signage
- 2. Creating a partnership with California State University, Monterey Bay to implement a no-cost Lake Management Plan resulting in a savings of \$40,000
- 3. Managing a fragile dune ecosystem
- 4. Using reclaimed stormwater for 98 percent of irrigation on the main base.

The team also engaged with base personnel and the public by giving native botanical tours and using symbolic fencing to direct the public away from protected areas while still providing access.

The dunes area of NSA Monterey is ecologically sensitive with two endangered plant species in evidence. Walkways have been created to prevent people from walking across the dunes and damaging the area. *Todd Wills*

Environmental Quality

These awards recognize efforts to ensure mission accomplishment and protection of human health in the areas of environmental planning, waste management, and compliance with environmental laws and regulations.

Non-industrial Installation

Commander, Fleet Activities Yokosuka, Japan

By maintaining strong working relationships with on- and off-base organizations, Commander, Fleet Activities Yokosuka (CFAY) consistently coordinates efforts to establish quick and thorough alternatives to avoid environmental degradation and destruction. With support from military and civilian personnel, base residents, and the cities of Yokosuka, Zushi, and Yokohama; team members successfully develop and maintain invaluable partnerships crucial to the success of the environmental program. CFAY's Environmental Division manages over 20 multi-media environmental programs, integrated through a capstone Environmental Management System (EMS). Its workforce is staffed with more than 30 U.S. and Japanese environmental professionals composed of engineers, environmental specialists, program managers, program analysts, and technicians.

Their accomplishments include:

- 1. Instituting an aggressive change in above-ground storage tanks assessment
- 2. Implementing a comprehensive Internal Assessment Plan and standardized internal review process



Yokosuka Middle School students observe the aeration process at the wastewater treatment facility on the Yokosuka Naval Complex as Ms. Shinobu Hagio looks on.

Yoko Echizen

 Participating in the annual Health, Safety and Environmental Awareness Fair, providing environmental oversight and consultation services.

In addition, the Qualified Recycling Program (QRP) diverted over 6,000 tons of recyclable material and QRP revenues exceeded \$1 million for the second consecutive year.

Joint Expeditionary Base Little Creek— Fort Story, Virginia Beach, Virginia

Environmental protection is an integrated, ongoing part of JEBLCFS's mission. The environmental staff ensures protection of resources, and compliance with regulatory permits to keep training sites and facilities operational at all times. JEBLCFS' EMS program is actively registered to the International Organisation for Standardization (ISO) management standard 14001.

After an external audit, the base's most significant recognition was the resident command awareness—91 percent of personnel surveyed had knowledge of the base's EMS. To foster environmental excellence throughout the base they incorporated methods such as hands-on training, consistent and concise communications, and weekly site visits; and distributed 20,000 EMS "Green Cards." They provide solutions to overcome problems that may impact the installation's permits and compliance. Other accomplishments include zero discrepancies during nine federal, state and local agency inspections, and a decline in hazardous waste disposal. The base achieved a 63.2 percent reduction in off-site routine hazard waste disposal since 2007, saving approximately \$254,000 in disposal costs.



Each year, the JEBLCFS environmental staff works with a local elementary school, providing space and assistance as they raise their own oysters. This project has provided an educational opportunity to the children and has enabled them to play a role in the restoration of the Chesapeake Bay.

Scott Mohr

Navy Region Center Singapore

With the implementation of the EMS, Navy Region Center Singapore (NRCS) has identified energy and solid waste reduction as two major focus areas. Significant accomplishments include successfully reinstalling the EMS; completing triennial major claimant environmental quality assessment; offloading over 347,000 pounds of shipboard-generated industrial waste, and implementing an effective solid waste QRP. NRCS installed over 2,000 backflow preventer devices to ensure protection of the water supply; conducted training to enhance spill response capability; established two functional Regional and Installation Water Quality Boards to oversee drinking water standards; and gave lighting retrofit for nine buildings to reduce energy consumption.

Individual or Team

Dr. Awni Almasri, U.S. Naval Support Activity Bahrain, Bahrain

Dr. Almasri continually manages broad and complex multi-media environmental programs in the most diverse and dynamic operating theater in the world, Southwest Asia. His hard work and tireless efforts were the main reasons for NSA Bahrain to successfully pass the recent external EMS audit resulting in the base re-declaring conformance to ISO management standard 14001.

By specifically targeting source reduction and recycling, the programs Dr. Almasri designed and managed reduced costs by over six million dollars over the past two years. The implemented programs also target the life cycle nature of the activities, thereby assuring continued savings into the future. Under Dr. Almasri's proactive leadership, NSA Bahrain Environmental Team continues its unwavering support by adapting to tenant commands' and Fleet needs, initiating new programs, and improving existing ones to enhance the quality of life for NSA Bahrain personnel, tenant commands, U.S. 5th Fleet, and the surrounding communities. Through face-to-face meetings, bulletin boards, brochures, emails, newspaper articles, Earth Day, and posting on the NSA Bahrain web site, Dr. Almasri demonstrates an ongoing commitment to promoting environmental management. Dr. Almasri has also worked diligently with host nations to form a plan to properly manage oil spills and to ensure the Navy's and host nation plans are compatible.



More than 200 NSA Bahrain volunteers participated in the 2013 week-long Earth Day celebration. Volunteers planted more than 55 plants and collected over 83,000 pounds of garbage, of which over 65 percent was recycled. Jayakumar Nair

Fleet Logistics Center Pearl Harbor, Hawaii (Environmental Quality Team)

The Naval Supply Systems Command (NAVSUP) Fleet Logistics Center Pearl Harbor Environmental Quality Team made significant improvements in energy conservation, environmental protection, and natural resources protection. The team sought out experts from other Navy commands and federal agencies to identify best practices, review alternative courses of action, and determine the optimum solution to meet command mission requirements while ensuring environmental requirements and energy goals were met. The team's major accomplishments include:

- Replacing traditional landscaping with xeriscaping to reduce water consumption
- 2. Replacing 13 gasoline powered vehicles with electric plug-in trucks
- 3. Installing power-saving timer devices to reduce energy
- 4. Participating in the Navy Exchange Earth Day Fair
- Sponsoring the Pearl Harbor installation-wide electronic equipment recycling event for all DoD agencies.



Team Leader Lieutenant Commander Watson (left) inspects a native Hawaiian pohinahina (*Vitex rotundifolia*) at the newly xeriscaped area aboard the Fleet Logistics Center Pearl Harbor. This shrub and other Hawaiian plant species thrive in this particular area's climate with very little or no supplemental irrigation. *James Murray*

Naval Base Ventura County, California

Naval Base Ventura County (NBVC) is comprised of three operating facilities: Point Mugu, Port Hueneme, and San Nicolas Island (SNI). With over 60 environmental standard operating procedures, over 15 base environmental instructions, and over 20 permits/plans specific to a regulatory requirement, the Environmental Quality Team set polices and guidance to ensure environmental impacts were minimized throughout NBVC. The staff works to coordinate and minimize environmental constraints to the military mission while ensuring compliance with environmental regulatory requirements. They established an aggressive and effective energy and water program designed to drive down the consumption of utilities. The command is focused on its energy and water reduction goals and is currently meeting and exceeding the Executive Order 13423 goal for its reportable energy and water usage. During FY 2012 and FY 2013, the NBVC Environmental Quality Team stayed current in their program areas and implemented new and innovative ways to improve the program. In many cases, environmental experts were in the field during critical operations to ensure successful execution of the military mission while protecting the natural resources.



A Peregrine Falcon in flight at SNI. Once listed as a federally endangered species, this bird remains as a fully protected species in California. The first documented nesting of Peregrine Falcons at SNI occurred in FY 2013.

Large Ship

USS Frank Cable (AS 40)

Homeported at Apra, Guam, USS Frank Cable is an Emory S. Land class submarine tender with a crew of 950 Navy Sailors and 156 civilian mariners from the Military Sea Lift Command. To help the marine environment, Cable installed an Oily Water Separator to separate oil from bilge water, which prevents discharge of waste oil. The ship's Paint Application and Removal Policy (FRANKCABLEINST 5103.1) was signed into instruction in March 2013. This instruction minimizes aggressive paint removal techniques to prevent lead dust from becoming airborne. Cable purchased and installed two state-of-the-art hazardous material vans to provide storage for up to four submarines at one time. These vans have automatic fire suppression systems, alarm systems in direct contact with fire and emergency services; and contain sumps with drain fittings to contain spills, climate control, and a four-hour fire rating. Cable's "capstone" environmental project this year included 203 Sailors and family members providing over 1,100 hours on a seven-month project with the Guam National Wildlife Refuge.



USS Frank Cable conducts maintenance and support of submarines and surface vessels deployed in the U.S. 7th Fleet area of responsibility.

MC3 Chris Salisbury

USS Nimitz (CVN 68)

During the Great Green Fleet demonstration, USS Nimitz was successful in the first-ever Carrier Strike Group-wide use of IP-5 bio-fuel. One hundred fifty-three aircraft were fueled with bio-grade JP-5 fuel over three flying days as Nimitz flawlessly managed the on-load and issuance of 187,000 gallons of the fuel. Nimitz completed 50 transits within restricted waters, two passages through the Suez Canal, and safely transferred more than 2.9 million gallons of sewage and 900 pallets of hazardous waste in four different fleets with no incidents. Eighteen hazardous material spill drills were conducted during Nimitz' 2013 deployment, which ensured watch personnel and command duty officers were properly trained in spill response and reporting criteria worldwide. Volunteers from Nimitz cleaned two miles of Honolulu Harbor collecting debris from an ocean-side barrier. Other community relations projects included forest preservation in Snohomish, County, the Everett Green Partnership Project and renovating an animal shelter. Nimitz conducted more than 36 replenishments, moving over 1,000 pallets of hazardous materials and 22.9 million gallons of fuel without incident in the Pacific and Indian Oceans as well as the Mediterranean and Tyrrhenian Seas.



USS Nimitz. MC3 Katarzyna Kobiljak

USS Ronald Reagan (CVN 76)

Homeported in Naval Base Coronado, San Diego, USS Ronald Reagan is the ninth aircraft carrier of the Nimitz Class. In 2012, during the Docked Planning Incremental Availability in Bremerton, Washington, USS Reagan achieved zero environmental violations through proper hazardous material and hazardous waste handling and disposal in accordance with shipyard standards. The ship

also emphasized environmental protection during project meetings and through joint safety/housekeeping walk-throughs conducted by the ship's safety department, safety representatives from Puget Sound Naval Shipyard, and outside repair organizations. To prevent unauthorized disposal of debris and water in the dock, all overboard fixtures (i.e., deep sinks, deck drains) were marked with "Fish—No Dumping" labels to eliminate inadvertent discharge into the dock and the bay.

Reagan completed 13 overboard oil and hazardous spill drills during the award period, in addition to two Afloat Environmental Awareness and Response Training sessions provided by the Regional Waterfront Environmental Coordinator, to ensure personnel are properly trained in spill response and reporting. The ship also initiated and implemented import recycling of paper, plastics, and aluminum cans through coordination with Naval Base Coronado's Sustainable Solid Waste Program. The crew also conducted eight beautification and cleanup projects, enhancing community relations and environmental stewardship.

methods and processes that could create significant impacts to the environment. The base currently has four buildings with Leadership in Energy and Environmental Design (LEED) certifications (two gold and two silver). A fifth building is currently under construction that will achieve the Silver certification. Renovations were made to other facilities to utilize effective energy and water reduction, including high-efficiency interior and exterior lighting; equipment and lighting controls; low-flow plumbing fixtures; remote-controlled evapotranspiration irrigation controllers; renewable energy systems; and high-efficiency mechanical equipment. NBVC's construction activities for renewable energy were developed through wind, solar thermal and environmental planning, pollution prevention, solid waste management program, and community engagement. Representatives from NBVC also participated in judging student science projects at the Hueneme High School and the Ventura County Science Fair.



USS Ronald Reagan.
MC2 Stephanie Smith

Sustainability

This award recognizes efforts to prevent or eliminate pollution at the source, including practices that increase efficiency and sustainability in the use of raw materials, energy, water, or other resources. Nominations may be from the military departments or Defense Agencies for any U.S. military active or closing industrial installation worldwide.

Industrial Installation

Naval Base Ventura County, California

The EMS is a fundamental component of NBVC's daily operations. The Environmental Division continues to enhance the way NBVC does business by standardizing



Mugu Lagoon at NBVC, Point Mugu provides habitat for thousands of migratory bird species, as well numerous invertebrate, fish, and plant species. The environmental planning review process allows wetlands and natural resource program managers to review proposed projects that have a potential to impact these areas. *Francesca Ferrara*

Naval Weapons Station Seal Beach, California (including Detachments Fallbrook and Norco)

Naval Weapons Station (NWS) Seal Beach and its two detachments generated a massive reduction in hazardous waste and sustainable solid waste, while simultaneously using innovative approaches in water and energy conservation. Using analysis and design for in-

house low-impact development dramatically reduced contract cost. Participants also continued public outreach, both internal and external to the station.



NWS Seal Beach and the Seal Beach National Wildlife Refuge hosted a volunteer event in October 2012 to remove invasive plants, prepare the land for restoration, and plant native plants. Volunteers from public and community groups planted over 750 native shrubs and flowers, the highest number since the annual event began nine years ago.

MCI Eli Medelin

Portsmouth Naval Shipyard, Maine

Portsmouth Naval Shipyard (PNSY) is a nuclear-powered submarine maintenance installation that has successfully accelerated its energy and sustainability programs. A continuous commitment to process improvement and reducing environmental impacts has been achieved by reducing or eliminating unnecessary steps and streamlining process flows. PNSY's energy and water consumption continues to decrease, with reductions exceeding goals by 20 to 25 percent, respectively. A solar ventilation system is being constructed and is projected to save roughly \$22,000 in fuel costs per year. Successful programming, designing, and building upgrades and renovations have been implemented to increase performance and sustainably. Four LEED projects are Gold Certified and contribute to successful High Performance Sustainable Building (HPSB) projects. PNSY is on track for meeting the FY 2015 HPSB goal upon completion of energy renovation projects currently in construction. Regional planning with a local bus service has successfully started an express style commuting option to the base.



The "Sail" in PNSY's logo, "Sails to Atoms" is landscaped into the green roof of the LEED Gold certified Administrative Building. The roof provides for increased biodiversity, natural stormwater management, and roof insulation for increased energy efficiency. *Melissa Kalicin*

Cultural Resources Management

This award recognizes efforts to promote cultural resources stewardship in the DoD by highlighting outstanding examples of cultural resources management. Awards are designed to showcase DoD's extensive cultural resources including archaeological sites and cultural landscapes. Desired initiatives include partnering with external stakeholders such as Native Americans, State Historic Preservation Officers, and local communities; and internal stakeholders such as master planning, public works, and range management. Nominations may be from the military departments or defense agencies for any U.S. military active or closing installation worldwide.

Installation

Commander, Fleet Activities Yokosuka, Japan

By maintaining strong working relationships with on- and offsite entities, the installation's cultural resources management program at CFAY consistently manages its cultural resources and promotes opportunities for cultural research, partnerships and conservation. With strong support from base personnel, partnerships with the Yokosuka City Museum, the Yokosuka Board of Education, the Zushi Board of Education, and the Cities of Yokosuka, Zushi, and Yokohama; CFAY has successfully developed and maintained invaluable relations crucial to the success

of the cultural resources program. Among its many efforts, CFAY recruits and educates volunteers to support resource protection efforts; reviews and continually monitors new projects from conception to completion to ensure continued compliance throughout the projects' lifecycles and maintains curation and preservation agreements with the city of Zushi. During FY 2012 and FY 2013, the Environmental Division screened over 500 contracts with zero incidences of adverse impacts to either the CFAY's mission or its cultural resources, which include 35 archeological sites, 260 historical buildings, and drydocks built in the 1860's.



The C2 building was originally the headquarters for the Japanese Imperial Navy, Yokosuka District. Following World War II, it became the headquarters for CFAY. While utilized by U.S. Forces operating in Japan, it is preserved in place with its original structural integrity intact. Ryouko Araki

Joint Base Pearl Harbor-Hickam, Hawaii

The cultural resources management effort at Joint Base Pearl Harbor-Hickam (JBPHH) is characterized by a strong teamwork ethic that has solidified its partnerships with the Navy, Air Force, and more than 120 other major DoD tenant commands operating within the installation. The Cultural Resources Management office has proactively sought opportunities to increase efficiencies and reduce costs through the development of planning and database tools; enhanced the functionality of its Integrated Cultural Resources Management Plan; and initiated process improvements to streamline its stewardship program.

The Cultural Resources Management office received ten preservation honor awards for work completed between 2012 and 2013 from the Historic Hawai'i Foundation in recognition of its valuable and consistent stewardship of JBPHH's historic assets. The Makahiki, or "Hawaiian Thanksgiving," provides an annual opportunity for military families to appreciate and learn more about the culture and history of Hawaii. The event, which takes place on the JBPHH installation's Hickam Harbor Beach, symbolizes JBPHH's long history of successful partnerships with Native Hawaiian groups including the Office of Hawaiian Affairs, the Owen County Heritage and Cultural Center, and the Oahu Burial Council.



The renovated Hickam Fitness Center was also recognized with a local preservation honor award.

Sarah Fry

F/A-18E/F & EA-18G Program Office, PMA-265 Green Hornet Team, Patuxent River, Maryland

The Green Hornet Team (GHT) manages the environment, safety, and occupational health program for the Super Hornet and earlier aircraft. During the reporting period, the team installed a new exhaust nozzle on the F414/F404 engine, demonstrating an overall three-decibel noise reduction. Tests also demonstrated achievement of the critical criteria—no impact to thrust through maximum afterburner engine settings—ensuring Fleet acceptance of this noise reduction engineering solution.

The team took one more step in their ongoing efforts towards a hexavalent chromium-free F/A-18 and EA-18G by applying a new non-chrome primer and coating to 12 planes. In partnership with the National Aeronautics and Space Administration, the GHT also demonstrated the potential for a three percent fuel burn reduction, which could result in a fuel savings of approximately six million gallons per year. The team continued its focus on alternative fuels by laboratory and hardware testing of an alcohol-to-jet process application. Also notably, the F/A-18A-D logged 110,514 flight hours in FY 2013 without a Class A mishap.



F/A-18E with Variable Exhaust Nozzle (VEN) chevrons sits on the tarmac at NAS Patuxent River. Tests demonstrated integration of VEN chevrons onto the F414/F404 engine can achieve upwards of a 3-decibel reduction over much of the frequency range. PMA-265

P-8A Poseidon Environment, Safety, and Occupational Health Team, Patuxent River, Maryland

The P-8A Poseidon Environment, Safety, and Occupational Health Team is a multidisciplinary group of professionals from the Naval Air Systems Command P-8A Fleet Support Team and Boeing that applied a synergistic approach to present a solution to tracking and reporting hazardous material content on the as-delivered system and for maintenance. The Hazardous Materials Authorized Use List delivered to Patrol Squadron VP-16 ensured appropriate maintenance materials were available in Japan prior to aircraft arrival and will become the Program Office's template for future deployments. Adequate material stocking affords the U.S. Navy a lifetime cost savings for

reduced material removal/hazardous waste management due to expired chemicals and/or unused excess. A more thorough, dynamic method of hazardous material tracking benefits more than just the Program Manager Air (PMA-290) Program. The P-8A platform served as Boeing's prototype for system proof of concept. Lessons learned from the P-8A approach to hazardous material characterization are currently being leveraged in development of mechanisms for Hazardous Materials Management Program/Pollution Prevention reporting on the Air Force Tanker program.

PMA-290 also developed a pilot program to equip P-8A lookouts with onboard resources to facilitate a better understanding of marine mammal/sea turtle behavior for identification, increased post-action reporting accuracy, and compliance with National Environmental Policy Act, Executive Order 12114, and Marine Mammal Protection Act regulations and permit requirements. The program offers transferability to System Commands and the Fleet employing active underwater sound devices to minimize cost, schedule, and potential environment, safety, and occupational health risks associated with testing delays.

Poseidon and more than a dozen P-3C Orion patrol aircraft stand aligned on the tarmac during Rim of the Pacific (RIMPAC) 2012. RIMPAC is the world's largest international maritime exercise. MC1 Paul Seeber



The **Awards** Process

The annual CNO Environmental Awards program recognizes installations, individuals, teams, and Navy ships that demonstrate environmental excellence and are the first step in a three-part competition within the DoD. Winners at the CNO level become nominees, along with Marine Corps nominees, at the Secretary of the Navy (SECNAV) level of competition. With the exception of the small ship and environmental planning categories, which have no equivalent at the Secretary of Defense (SECDEF) level, winners at the SECNAV level become nominees at the SECDEF level of competition.

Congratulations again to all 27 of the FY 2013 CNO Environmental Award winners for their dedication to environmental excellence.

CONTACTS

Katherine Turner

Chief of Naval Operations Energy and Environmental Readiness Division 703-695-5073

DSN: 225-5073

katherine.m.turner.ctr@navy.mil

Ashley Tolbert

Chief of Naval Operations Energy and Environmental Readiness Division

703-695-5116

DSN: 225-5116

ashley.tolbert.ctr@navy.mil

NUWC Newport Partners with National Grid to Tackle Energy Conservation

Annual Energy Savings of Plan Estimated at \$1.5 Million

THE NAVAL UNDERSEA Warfare Center (NUWC) Newport, Rhode Island is utilizing a utility energy services contract (UESC) with their local utility provider to help meet the energy-saving goals set by the Secretary of the Navy (SECNAV) and other government agencies.

In 2012, NUWC Newport took steps to achieve aggressive goals set by the

executes the actual construction—estimated at about \$13.2 million for the NUWC Newport project. The utility then assures the equipment performance and standards of service. In a UESC, the benefitting client repays the utility over the term of the contract from the revenue that would have otherwise been used to pay for the old, higher level of utility consumption.

the initial investment. The IGA report identifies, evaluates, and documents various infrastructure improvement and cost reduction strategies. The ECMs presented in the report will blend energy reduction measures with measures that save or avoid non-energy operational costs. At completion, the project will provide a viable program to help NUWC Newport meet

The project will provide a viable program to help NUWC Newport meet its energy goals, improve the operational conditions and comfort of its facilities, and ultimately deliver savings to the taxpayer.

SECNAV for conserving energy, including a 50 percent reduction in shore energy consumption per square foot by the year 2020.

Among the many initiatives NUWC Newport will use to meet the challenge is a UESC with National Grid, NUWC's electricity and natural gas utility provider. A UESC is a partnership between the Navy and the utility company, which assesses the opportunities for conservation, designs the measures, fronts the capital costs, and

National Grid has a portfolio of monetary incentives for various energy conservation measures (ECM) that will be utilized to reduce the government's repayment obligations for the ECMs proposed.

National Grid and Siemens Industry, Inc. recently completed the investment grade audit (IGA) phase for NUWC Newport's UESC project to document the cost effectiveness of proposed ECMs to the standards set by the commercial lenders who will finance its energy goals, improve the operational conditions and comfort of its facilities, and ultimately deliver savings to the taxpayer.

The IGA identified the following seven categories of ECMs:

- 1. Building controls upgrades
- 2. Heating, Ventilation, and Air Conditioning (HVAC) improvements
- 3. Lighting retrofits
- 4. Building envelope upgrades



NUWC Newport, part of Naval Station (NAVSTA) Newport, sits on the shores of Narragansett Bay in Newport, Rhode Island. Its 189.5 acres supports 77 buildings. This project aims to produce annual savings projected at \$1.5 million and \$13 million in estimated energy savings over the life of the project.

- 5. Steam system upgrades
- 6. Motor and drive improvements
- 7. Water conservation

Together, these ECMs have a projected annual energy savings of \$1.5 million. This translates to a 20.4 percent reduction in annual energy costs. The total project cost is estimated at \$13.2 million, leading to an overall project simple payback of 7.1 years after operational savings and a National Grid monetary incentive package of \$1.0 million is applied.

Building controls upgrades would provide improved temperature control and scheduling of HVAC systems at 14 NUWC Newport buildings. The existing direct digital control systems (DDC) for HVAC systems will be utilized for these improvements which include:



Improved makeup water controls installed on NUWC Newport's Building 1320 cooling tower are projected to save \$12,800 per year.

- Optimizing the startup and shut-down procedures for HVAC equipment
- Implementing demand control ventilation that varies ventilation flow below peak maximum based on feedback from sensors
- Adding control of exhaust fans to the existing DDC to reduce run time and reduce exhaust of conditioned air during unoccupied periods.

The improvements also involve calibrating or replacing air temperature sensors to improve space temperature control

to set points, reduce waste caused by temperature undershoot and overshoot, and improving equipment scheduling to better match space occupancy patterns.

These measures also include replacement of aged and deteriorated air handling units (AHU) that have reached or exceeded their useful economic life, and replacement of aged water source heat pumps with units incorporating enhanced energy conserving features. Other measures include the installation of high-efficiency chillers to replace deteriorated older generation chillers, installation of destratification fans to recycle warm air from the ceilings

The SECNAV's Energy Goals

AS THE DEPARTMENT of the Navy (DON) works to reduce energy consumption and lead the nation toward energy independence, the SECNAV has outlined five energy goals. These goals seek to enhance and better enable our combat capabilities, to provide greater energy security. Outlined below are examples of how the Navy is moving forward to achieving each of the goals.

Increase Alternative Energy Use DON-wide

By 2020, 50 percent of total DON energy consumption will come from alternative sources.

- Continue aggressive pursuit of both large and small scale renewable energy projects on or near DON installations.
- Partner with industry, commercial aviation, and other government agencies to develop a demand signal to alternative fuel industry and encourage growth of a domestically produced, cost competitive biofuel industry.
- Decrease energy consumption, both ashore and afloat, through installation of energy efficient technologies and development of policies that encourage energy awareness and conservation.

2. Increase Alternative Energy Ashore

By 2020, DON will produce at least 50 percent of shore-based energy requirements from alternative sources.

- Continue installation of energy efficient upgrades to buildings and facilities.
- Encourage military members and families to conserve energy through incentives and other programs to empower them to save and be aware of their own energy consumption.

 Produce or consume one Gigawatt of new, renewable energy to power naval installations across the country using existing authorities such as Power Purchase Agreements, enhanced use leases, and joint ventures.

3. Sail the "Great Green Fleet"

By 2012, DON will demonstrate a Green Strike Group in local operations and sail it by 2016.

- In 2012, DON successfully demonstrated a Green Strike Group at the Rim of the Pacific exercise off Hawaii.
- The DON remains focused and on track to sail the Great Green Fleet by 2016—ushering in the "new normal" where biofuels will be a constant and regular part of our operational platforms.

4. Reduce Non-Tactical Petroleum Use

By 2015, DON will reduce petroleum use in the commercial vehicle fleet by 50 percent.

- Increase purchase and use of flex fuel vehicles, hybrid electric vehicles, and neighborhood electric vehicles.
- Expand alternative fuel infrastructure to support these vehicles.

5. Energy Efficient Acquisition

Evaluation of energy factors will be mandatory when awarding contracts for systems and buildings.

- Create a standardized process for determination of lifecycle energy costs, fully-burdened cost of energy and other energy related characteristics of potential platforms, weapons systems, and buildings.
- Encourage contractors to minimize energy footprint and factor energy into the acquisition decision making process.



of high bay spaces, and conversion of one AHU from constant to variable volume to reduce airflow and fan power as cooling load decreases.

A base-wide lighting assessment was performed to identify areas in which lighting efficiency could be improved beyond what was achieved by NUWC Newport in two previous generations of efficiency upgrades, and to identify areas where operating hour reductions are viable. The proposed improvements will include better efficiency of

both interior and exterior lighting as well as the enhanced use of motion sensors and photocell controls to reduce operating hours based on

Building envelope upgrades will include application of rigid insulation to the outer shell of several buildings as well as base-wide weather-stripping, sealing, and localized insulation repair/replacement to limit building air infiltration, reduce thermal losses, and prevent damage by water penetration through the building envelope.

To identify steam system upgrade possibilities, assessments of steam traps interior to buildings where NUWC





As part of its UESC project, NUWC Newport will install this type of energy efficient chiller with a control panel in Building 1319.

Newport has maintenance funding responsibility were performed. Steam traps that have failed or are leaking will be replaced. In addition, exposed steam piping, valves, and interior fittings will be insulated to reduce thermal losses.

Motor and drive improvements have been identified in 11 buildings where variable frequency drives will be installed and select motors will be replaced with premium efficiency motors.

Water conservation measures are planned for implementation widely throughout NUWC Newport-occupied buildings on the base. Toilets, aerators, and shower heads will be replaced with low flow units. In two buildings, a total of 11 urinals consuming only a pint per flush will be installed. The cooling tower on the roof of NUWC Newport's largest building will have new

basin level switches installed along with motor-operated valves (to supplant unreliable float-actuated valves) for makeup flow control. A high level alarm with auto dialer notification will warn if the level control has failed allowing the tower water to spill into the overflow drain. In the existing setup, wastage down the overflow drain inlet is nearly undetectable without going to the roof and climbing on a ladder to visually observe the cooling tower basins.

In addition to the measures indicated above, the IGA analysis encompassed other potential ECMs including several involving renewable energy. These measures were found to be insufficiently cost-effective for inclusion in the UESC contract vehicle. The analytical data and calculations have been retained

for use in evaluating potential non-financed projects that have allowable payback periods up to 25 years.

NUWC Newport facilities use a mix of electricity and steam that is purchased and/or generated by the Naval Facilities Engineering Command (NAVFAC) public works office serving NAVSTA Newport. Both energy streams are paid for out of NUWC Newport's Navy Working Capital Fund budget based on how much the Command uses.

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The primary goal of the UESC project is to reduce the energy and water usage at NUWC Newport using measures determined to be cost-effective.

Electricity is purchased from National Grid and distributed to end users from the Navy-owned infrastructure. Steam is distributed using a Navyowned piping network, originating at NAVSTA Newport's central steam plant which operates from October through May. On-base potable water and sewer systems are also operated by the NAVFAC public works office and NUWC Newport is billed by NAVFAC for amounts actually used.

The primary goal of the UESC project is to reduce the energy and water usage at NUWC Newport using measures determined to be cost-effective. Executive Order 13423 requires federal agencies to meet building energy use targets established by the National Energy Conservation Policy Act as amended by the Energy Policy Acts of 1992, 2005 and 2007.

Going even further, Executive Order 13514 directs agencies "to establish an integrated strategy towards sustainability and to make reduction of greenhouse gas emissions a priority." The ECM recommendations in the UESC project will provide NUWC Newport with the ability to reduce annual electricity consumption by 15 percent, decrease annual steam consumption by 35 percent and result in an estimated reduction



NUWC Newport's UESC project includes building envelope work such as window/door weather stripping and joint sealing. The scope of work is based on a methodical survey. This photo illustrates the use of tracer smoke to identify leaks. This work is projected to save \$183,000 per year.

of 4,500 metric tons of carbon dioxide greenhouse gases per year.

NUWC Newport is one of two divisions of the Naval Undersea Warfare Center. NUWC Newport's mission is to provide research, development, test and evaluation, engineering and fleet support for submarines, autonomous underwater systems, undersea offensive and defensive weapons systems, and countermeasures.



CONTACT

John Woodhouse Naval Undersea Warfare Center Division Newport 401-832-4256 DSN: 832-4256 john.woodhouse@navy.mil

Uniform National Discharge Standards Underway

Navy & EPA Make Progress Toward Final Rules

REDUCING THE ENVIRONMENTAL impact of liquid discharges from Navy ships has been a priority of Navy's afloat environmental program for decades. In recent months, the Navy and the U.S. Environmental Protection Agency (EPA) have made great strides toward implementing new nationwide standards for these types of discharges. When finalized, these standards will provide consistent, environmentally protective requirements for overboard liquid discharges applicable in waters of the United States and extend seaward out to 12 nautical miles from the coastline.

rizes the EPA to regulate discharges of pollutants into U.S. "navigable waters," which include ocean waters within three nautical miles of the U.S. coastline. Prior to 1996, such "discharges incidental to the normal operations of a vessel," which include bilge water, ballast water, aqueous film-forming foam (AFFF), and firemain system water, were not regulated through federal permits. As a result, individual states were free to impose regulations that would apply only in waters subject to the state's authority. (Normally, states have authority to regulate out to three nautical miles from the

When finalized, these standards will provide consistent, environmentally protective requirements for overboard liquid discharges applicable in waters of the United States and extend seaward out to 12 nautical miles from the coastline.

Development of these standards began in the mid-1990s, when the Navy recognized that these kinds of requirements needed to be uniform and predictable throughout all U.S. waters. This would allow the Navy to acquire, homeport, and operate ships to meet a single set of federal standards rather than a "patchwork quilt" of individual state or territorial discharge requirements.

Federal Regulation of Discharges from Ships

The Federal Water Pollution Control Act of 1972, commonly referred to as the Clean Water Act, autho-

state's coastline.) Without comprehensive federal regulation, the Navy worried that if each U.S. coastal state imposed unique and separate requirements, each ship's commanding officer would need to manage and employ widely disparate protective measures to obey state law depending on the ship's location. The Navy also feared that its acquisition officials would be required to procure shipboard equipment for a constantly shifting and unpredictable landscape of environmental requirements. Required equipment that might be easily installed on a commercial ship could be difficult or impossible to place and operate on a Navy ship with the severe space,



In recent months, the Navy and EPA have made great progress toward implementing new nationwide standards for liquid discharges from Navy ships.

weight, and operational constraints they have in comparison to their civilian counterparts.

Request for Uniform Discharge Standards

Against this regulatory backdrop, in the early 1990s, the Navy asked the Department of Defense (DoD) and Congress to create a Uniform National Discharge Standards (UNDS) program for liquid discharges under the Clean Water Act. Congress responded via the 1996 National Defense Authorization Act, which amended the Clean Water Act to establish the UNDS program for vessels of the Armed Forces in Section 312(n). This established a three-phase process for implementing discharge regulations applicable to vessels operated by any branch of the Armed Forces, defined for the purpose of UNDS to include U.S. Coast Guard ships.

Phase I requires DoD and EPA to jointly determine all discharges incidental to the normal operations of a vessel of the Armed Forces, and also to determine which discharges require control by a Marine Pollution Control

Device (MPCD)—any equipment or management practice installed or used onboard a vessel to control a discharge—before the discharge may be introduced into the marine environment. This is based on the following seven factors:

- 1. Nature of the discharge
- 2. Environmental effects of the discharge
- 3. Practicability of using a MPCD
- 4. Operational impact of using a MPCD on a vessel
- 5. Applicable U.S. law
- 6. Applicable international standards
- 7. Costs of MPCD installation and use

For Phases I and II, DoD delegated its responsibility to work with EPA for UNDS rulemaking to the Navy, and in May 1999 Phase I was completed. In all, 39 discharges incidental to the normal operations of U.S. Armed Forces vessels were identified, 25 of which were determined to require control.



The Navy and EPA determined that 25 discharges incidental to the normal operations of U.S. Armed Forces vessels require control under the UNDS program.

Discharges Requiring Control

There were 25 discharges incidental to the normal operations of U.S. Armed Forces vessels that were determined to require control.

- 1. Aqueous Film-Forming Foam
- 2. Catapult Water Brake Tank and Post-Launch Retraction Exhaust
- 3. Chain Locker Effluent
- 4. Clean Ballast
- 5. Compensated Fuel Ballast
- 6. Controllable Pitch Propeller Hydraulic Fluid
- 7. Deck Runoff
- 8. Dirty Ballast
- 9. Distillation and Reverse Osmosis Brine

- 10. Elevator Pit Effluent
- 11. Firemain Systems
- 12. Gas Turbine Water Wash
- 13. Graywater
- 14. Hull Coating Leachate
- 15. Motor Gasoline Compensating Discharge
- 16. Non-Oily Machinery Wastewater
- 17. Photographic Laboratory Drains
- 18. Seawater Cooling Overboard Discharge
- 19. Seawater Piping Biofouling Prevention
- 20. Small Boat Engine Wet Exhaust
- 21. Sonar Dome Discharge
- 22. Submarine Bilgewater

- 23. Surface Vessel Bilgewater/Oil-Water Separator Discharge
- 24. Underwater Ship Husbandry
- 25. Welldeck Discharges

Discharges Not Requiring Control

The following 14 discharges will not require control under the newly-established UNDS program.

- 1. Boiler Blowdown
- 2. Catapult Wet Accumulator Discharge
- 3. Cathodic Protection
- 4. Freshwater Lay-Up
- 5. Mine Countermeasures Equipment Lubrication
- 6. Portable Damage Control Drain Pump Discharge

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There were 25 discharges incidental to the normal operations of U.S. Armed Forces vessels that were determined to require control.

- 7. Portable Damage Control Drain Pump Wet Exhaust
- 8. Refrigeration and Air Conditioning Condensate
- 9. Rudder Bearing Lubrication
- 10. Steam Condensate
- 11. Stern Tube Seals and Underwater Bearing Lubrication
- 12. Submarine Acoustic Countermeasures Launcher Discharge
- 13. Submarine Emergency Diesel Engine Wet Exhaust
- 14. Submarine Outboard Equipment Grease and External Hydraulics

After completion of UNDS Phase I rulemaking, the Clean Water Act preempts states from adopting or enforcing controls for discharges determined to not require control (14 UNDS discharges) as they apply to vessels of the Armed Forces. A state may also petition the EPA and DoD to review a determination of whether a MPCD is required to control a discharge from a vessel of the Armed Forces where there is new, significant information not considered previously by EPA or DoD.

Phase II requires DoD and EPA to jointly determine MPCD performance standards for those discharges requiring control. A MPCD can be either equipment or a management practice.

Phase III requires DoD to issue regulations specifying requirements for the design, construction, installation, and use of MPCDs for vessels of the Armed Forces. Upon completion of Phase III, existing state or local regulations for the discharges will be nullified, and future state or local regulatory action will be preempted. However, states can petition EPA to establish a no-discharge zone for a specific discharge.

Recent UNDS Progress & the Way Ahead

In late 2013, EPA and the Navy reached final agreement on standards for 11 of the 25 discharges requiring control. The UNDS standards for each of the 11

discharges are modeled as closely as possible, without unnecessarily restricting the ability of Navy ships to carry out their missions, on the corresponding standard in EPA's 2013 Vessel General Permit (VGP). The VGP provides discharge requirements applicable to non-military, non-recreational ships longer than 79 feet. A Notice of Proposed Rulemaking for the first 11 discharges was published in the Federal Register on February 3, 2014 with a 60-day public comment period. One comment was received. Finalization of the 11 discharge standards will take place after adjudication of the comment received and review and consultation with other federal agencies.

After Phase II is complete for these 11 discharges, the Navy will work with DoD to complete Phase III by promulgating implementing regulations for the discharges in 2015. During the Phase II and Phase III work to finalize the 11 discharges, the Navy will continue to work with EPA to finalize Phase II standards for the remaining 14 discharges. Even after Phase III has been completed for all MPCDs covering the 25 UNDS discharges requiring control, efforts to ensure the best, most effective measures to minimize the environmental impact of UNDS discharges waters will not end. The Navy will continue its record of environmental stewardship. In addition, the Clean Water Act requires DoD and EPA to review all UNDS discharge standards every five years. Constant review of standards ensures that the Navy will incorporate new pollution control technologies into the UNDS program when proven effective for Armed Forces shipboard use. 3

CONTACTS

Mike Pletke

Chief of Naval Operations Energy and Environmental Readiness Division 703-695-5184

DSN: 225-5184 mike.pletke@navy.mil

Katherine Weiler U.S. Environmental Protection Agency 202-566-1280 weiler.katherine@epa.gov

Navy Launches *Stewards of the Sea* Exhibit at Nauticus National Maritime Center Museum

Interactive Exhibit Showcases Marine Mammal Research & Shipboard Environmental Protection

ON MARCH 13, 2014 the Nauticus National Maritime Center Museum hosted a ribbon cutting ceremony for the Navy's *Stewards of the Sea: Defending Freedom, Protecting the Environment*, a highly interactive exhibit that showcases the U.S. Navy's ability to protect the environment and marine life. The exhibit is the culmination of two years of planning and design work, and is a partnership among Nauticus, U.S. Fleet Forces Command (USFF), and the Hampton Roads Naval Museum (HRNM).

serves as a reminder of how the Navy protects us every day, and now *Stewards of the Sea* will help our guests better understand how the Navy helps preserve and protect our waterways and marine life."

"This exhibit demonstrates, in an entertaining, imaginative manner, the highly technical environment in which naval personnel perform their duties," explained Elizabeth Pouillot. "Visiting families, children, and adults will

Partners in the project anticipate that the exhibit could reach a million visitors over the next four years, based on typical foot traffic at the museum.

Admiral Bill Gortney, commander, USFF, gave the opening remarks at the event.

"This exhibit will help educate America on what their Navy does for their nation, and what their Navy does to preserve the world's oceans," said Admiral Gortney.

Other key attendees and participants included Paul Fraim, Mayor of Norfolk; Ms. Elizabeth Poulliot, HRNM director; and Mr. Stephen Kirkland, Nauticus executive director.

Partners in the project anticipate that the exhibit could reach a million visitors over the next four years, based on typical foot traffic at the museum.

"We're thrilled about this partnership and this interactive exhibit," said Stephen Kirkland. "The Battleship Wisconsin encounter scenarios where they will have to choose the correct action to take, just like actual Sailors do on a daily basis while at sea."

Stewards of the Sea Vision for the Future

WHEN AND IF it is feasible, the Navy would like to leverage content from the Nauticus *Stewards of the Sea* exhibit to create similar exhibits at museums in other Navy Fleet concentration areas (e.g., San Diego, Hawaii, Jacksonville). This would enable expansion of the Navy's environmental stewardship message from the Hampton Roads area to a broader audience.



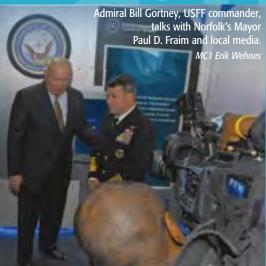


"Navy Lookout" station. Katherine Turner



Museum director, Admiral Bill Gortney, USFF commander, and Stephen E. Kirkland, Nauticus executive director, participate in the grand opening of the Navy's Stewards of the Sea exhibit at the Nauticus Maritime Museum. MC1 Erik Wehnes













The Basics about the Nauticus National Maritime Center Museum

NAUTICUS IS AN interactive science and technology center that explores the naval, economic, and nautical power of the sea. It serves as home of the Battleship Wisconsin and the HRNM. HRNM is a subordinate command of the Naval History and Heritage Command (NHHC) and physically resides within Nauticus under a memorandum of agreement between the City of Norfolk and the NHHC.

In 1994, the HRNM and Nauticus National Maritime Center Museum forged a mutually beneficial partnership when both opened to the public June 1 on Norfolk's Elizabeth River waterfront.

Nauticus and the Battleship Wisconsin allow visitors to explore the economic, naval, and natural power of the sea.

The 120,000-square foot maritime science museum includes hands-on exhibits, aguaria, 3D films, and National Oceanographic and Atmospheric Administration-related exhibits. For more information, visit www.nauticus.org.

The HRNM introduces visitors to more than 238 years of U.S. naval history in Hampton Roads, VA. One of ten officially operated U.S. Navy museums reporting to the NHHC, the museum hosts a rich collection of authentic uniforms, weaponry, underwater artifacts, detailed ship models, and artwork. Admission is free. For more information about HRNM, visit www.hrnm.navy.mil.

Nauticus, the Battleship Wisconsin, and the HRNM host 300,000 visitors annually from around the world and the complex is the site of many regional and community events.

Stewards of the Sea will help our guests better understand how the Navy helps preserve and protect our waterways and marine life.

-Stephen Kirkland

Through hands-on activities, videos, and large, color graphics that circle through the exhibit space, visitors can learn the steps the Navy takes to protect marine life; how the Navy manages shipboard waste; and what the Navy is doing to better understand the effects of manmade sound on marine mammals while continuing to fulfill its national security

mission. There is also a section of the exhibit devoted to Navy careers with an environmental focus.

Visitors to the exhibit can listen for enemy submarines using sonar; scan the horizon for whales through giant "Big Eye" binoculars; hear what whale calls sound like underwater; discover how whales are tagged and tracked for research; and learn about the scientific equipment the Navy uses to better understand the ocean environment.

The Stewards of the Sea exhibit is located on the third floor of Nauticus in downtown Norfolk, Va. For more information, call 757-664-1000 or visit the Nauticus web site at www.nauticus.org. 🗘

The Basics about U.S. Fleet Forces Command

USFF TRAINS NAVY forces to conduct prompt, sustained naval, joint, and combined operations in support of U.S. national interests. Other responsibilities are command and control of Navy forces and shore in support of the Chief of Naval Operations and operational planning and coordination support to Commanders at the U.S. Northern Command, U.S. Element North American Aerospace Defense Command, and U.S. Strategic Command. For more information, visit www.public.navy.mil/usff/pages/ environment.aspx, www.cffc.navy.mil, and www.facebook.com/USNavyStewardsoftheSea.

CONTACTS

Ted Brown U.S. Fleet Forces Command 757-836-4427 DSN: 836-4427 theodore.brown@navy.mil

Beth Bilderback **Nauticus Public Relations** 757-664-1017 Beth.Bilderback@norfolk.gov

Susanne Greene **HRNM Public Relations** 757-322-2986 susanne.greene.ctr@navy.mil

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Getting a Handle on Waste in the Pacific Northwest

NAVFAC Northwest Installations Take Action to Improve Their Integrated Solid Waste Management Programs

INSTALLATIONS IN THE Pacific

Northwest are taking actions to improve their Integrated Solid Waste Management (ISWM) Programs including the replacement of exterior waste and recycling collection containers at Naval Air Station (NAS) Whidbey Island, Naval Station (NS) Everett, and Naval Base Kitsap.

dollars of new exterior waste and recycling collection containers to be deployed throughout NAS Whidbey Island, Naval Base Kitsap, Naval Magazine Indian Island, and NS Everett to meet stormwater compliance as required by the U.S. Environmental Protection Agency. These new containers allowed the Navy to

opposed to the old method that required two trucks and four personnel five days to complete.

Along the flight line, 12 new roll-off recycling containers were added that borrowed heavily from a design provided by the NS Everett Public Works Department. The Whidbey staff

These new containers allowed the Navy to increase productivity, reduce the number of trips to the landfill, and decrease associated landfill and personnel costs.

The ISWM Program was implemented at every Navy installation in the Pacific Northwest through the various installation's Public Works Departments. Those departments focused on addressing installation-specific challenges while receiving overarching guidance and support from the Naval Facilities Engineering Command (NAVFAC) Northwest Public Works Business Line.

In 2013, the NAVFAC Northwest Public Works Business Line purchased more than two million increase productivity, reduce the number of trips to the landfill, and decrease associated landfill and personnel costs.

Naval Air Station Whidbey Island

At the NAS Whidbey Island recycling center, more than 100 old wooden collection containers for cardboard were replaced with new metal units that are serviced by a rear-load packer truck mounted on an existing roll off truck. Now all units are serviced by one person every four days as

increased the size of the box to include six on-board compartments, three on each side with an opening for specific materials. One opening is for paper, another for food/beverage containers. Each compartment has an internal material handling bin and a corresponding door. When the unit is serviced, it's loaded onto the trunk and taken to the recycling center. A forklift then removes and replaces the interior containers and the unit is returned to service in 30 minutes. The old process took about three and a half hours.

Naval Station Everett

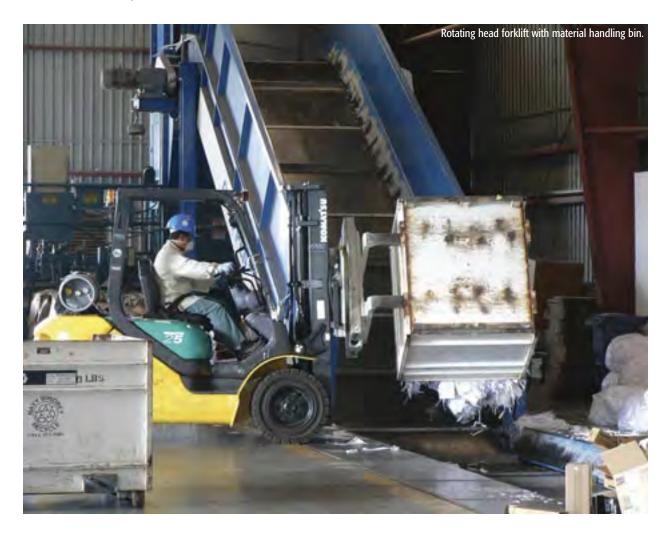
Naval Station Everett Recycling replaced 110 tow-cart style containers that had fallen into disrepair. The recycling center on the Station switched to a newer rear-load style container, purchased a second rear-load garbage truck type body for their hook-lift and like the Whidbey Island recycling center, greatly improved the efficiency of collecting materials for recycling, waste, and cardboard. The old containers were refurbished and are in use at Naval Base Kitsap for cardboard collection.

Adding two new 29 cubic-yard hooklift containers for wood debris collection allowed the Navy to deliver wood waste to a local compost facility out in town, instead of being hauled to Whidbey Island. This improved process eliminated a line item in a Navy contract that cost the Navy more than \$100,000 each year and removed the limit on the number of trips allowed.

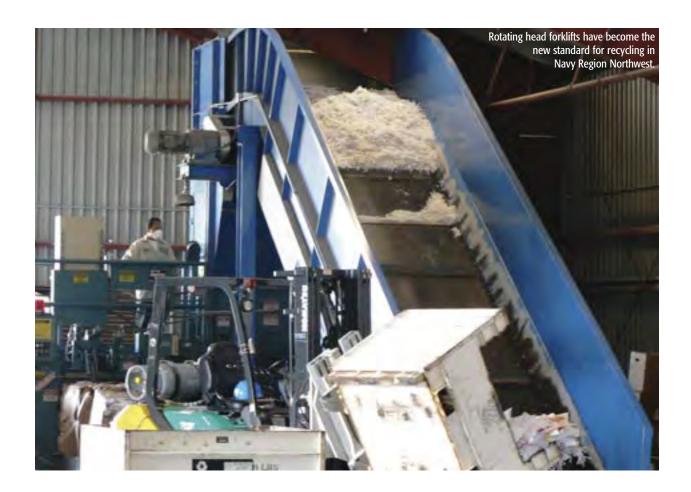
Naval Base Kitsap

The Naval Base Kitsap recycling center at Bremerton replaced all of their open-top roll-off boxes with either new covered roll-off containers or new front-load dumpsters. The recycling center worked with shops personnel to provide specialized front-load containers with pallet pockets on the

bottom of each container. Now Puget Sound Naval Shipyard & Intermediate Maintenance Facility's shop personnel use the smaller covered front-load containers. On trash day, they move their full containers outside and the Public Works Department truck services them. Converting to the new smaller front-load boxes consumes less space for trash containers, better service, less personnel and less truck time to remove the trash. Some of the new roll-off boxes include crane pick points to allow the boxes to be lowered into a drydock. This close coordination between the project teams and the transportation department greatly expedites service to the drydocks.



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A new ISWM database will soon roll out as the replacement for data tracking and will provide visibility of all solid waste collections, recycling shipments, sales, and invoicing.

Past practices identified a specific color to each recycle/waste stream and each roll-off box was painted to match. That system worked in the beginning, but as Navy contractors brought in their own roll-off boxes it became confusing. All containers at Naval Base Kitsap have been painted 'safety orange' with a new placarding scheme that identifies the contents, which prevents crossing waste streams and saves time.

Public Works Business Line

A new ISWM database will soon roll out as the replacement for data tracking and will provide visibility of all solid waste collections, recycling shipments, sales, and invoicing. This new database will track refuse and recycling down to the building level, provide analytical reports such as waste trend by building customer, type of activity at the building, recycling sales by commodity and tailor education and outreach information to a specific customer. The ISWM program manager will gain visibility of recycling sales and perform self-audits to verify compliance with federal and state laws, and Department of Defense regulations. This ISWM program will centralize sales contracts within the database and provide installations the visibility of their transactions but eliminates the need for them to handle funds. \$\mathcal{L}\$

CONTACT

Leslie Yuenger Naval Facilities Engineering Command Northwest 360-396-6387 DSN: 744-6387 leslie.yuenger@navy.mil















Colonel James Caley Talks About Getting Energy Innovations into the Hands of Marines

N THE SPOTLIGHT for this issue of *Currents* is the Marine Corps Expeditionary Energy Office (E2O) and its Director, Colonel James Caley. On March 26, 2014, Kenneth Hess, director of communication and outreach for the Chief of Naval Operations Energy and Environmental Readiness Division (OPNAV N45) and Bruce McCaffrey, managing editor of *Currents* magazine, sat down with Colonel Caley in his Pentagon office to talk about the mission and the recent successes of his office. Also joining in on the conversation were Katherine (Katie) Hantson, program analyst, and Captain Maureen Krebs, public affairs officer for the Expeditionary Energy Office.

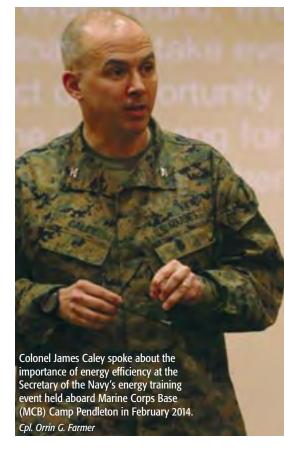
CURRENTS: For readers who may not be familiar with your background, could you provide highlights of your career in the Marine Corps?

CALEY: I graduated from The Basic School in April of 1990 and was assigned to Headquarters Battery, 11th Marine Regiment, as a Motor Transportation Officer and later as the

I know the cost of fuel on the battlefield—what it costs in terms of money, effort and the lives of injured Marines. It is really high—too high in fact.

Battery Executive Officer. I then deployed to Somalia as the Motor Transport Officer with 3d Battalion, 11th Marine Regiment. Upon my return, I was transferred to Marine Wing Support Squadron (MWSS) 272 where I served as the Motor Transport Division Officer in Charge and then the Squadron Logistics Officer.

Following a school assignment, I served on Inspector-Instructor duty with MWSS



Spothgaton the Marine Corps Expeditionary Energy Office

472. I was transferred to Taegu, Republic of Korea in 1999 where I served as the 3d Force Service Support Group Liaison Officer to the 19th Theater Support Command.

Upon my return from Korea, I served as the Operations Officer and Executive Officer for Brigade Service Support Group-1 at Camp Pendleton. From there I deployed as the Executive Officer of Combat Service Support Group-11 to Kuwait and Iraq.

In September of 2004, after attending the School of Advanced Warfare, I served as the Deputy Assistant Chief of Staff, G-5 (Plans), Marine Corps Forces Korea. In June 2006, I was transferred back to Camp Pendleton where I served as the Commanding Officer, Combat Logistics Battalion 13, and deployed to Iraq with the 13th Marine Expeditionary Unit. Following a year at the Industrial College of the Armed Forces, I was assigned to the Pakistan Afghanistan Coordination Cell on the Joint Staff.

In July of 2011, I was assigned as the Commanding Officer of Combat Logistics Regiment 1, 1st Marine Logistics Group, Camp Pendleton. In July of 2013, I was reassigned as the Director of the Marine Corps Expeditionary Energy Office.

CURRENTS: How has this experience prepared you for your current assignment?

CALEY: Given my experience as a commander of Combat Logistics Regiment 1, with seven battalions of Marines and three previous combat tours, during which my units lost Marines every single time, I know the cost of fuel on the battlefield—what it costs in terms of money, effort and the lives of injured Marines. It is really high—too high in fact.

My previous jobs as battalion and regimental commander helped me to appreciate the fuel requirements of our forward-deployed Marines. As a battalion

Programs of Record for Renewable Energy Systems

TO DATE, THE Marine Corps has implemented five Programs of Record (POR) for renewable energy systems that were first introduced by industry at past Experimental Forward Operating Bases (ExFOB).

1. Solar Powered Alternative Communications Energy System (SPACES)

SPACES is a lightweight, portable, renewable energy system designed to provide power for platoon- and squad-size units operating in remote locations. Marines use SPACES to recharge batteries that power communications equipment like satellite radios, reducing the number of batteries carried on extended patrols.

2. Ground Renewable Expeditionary Energy Network System (GREENS)

GREENS is a portable power generation system that incorporates solar panels, energy storage and AC/DC power sources. GREENS provides an average continuous output of 300 watts or 1,000 watts peak—enough to power a battalion combat operations center. Marines also use GREENS to power the High Mobility Artillery Rocket System and the Ultralightweight Field Howitzer, eliminating the need to tow a 3-kilowatt generator and reducing vehicle idle time.

3. Hybrid Power Systems

Hybrid power generation—combining batteries, solar, and smart controls with traditional diesel generators—has demonstrated up to 50 percent fuel savings and up to 80 percent reduced generator run time. The Marine Corps is working closely with the Army to develop joint requirements for and field hybrid power systems that will increase the combat effectiveness of both services.

4. Radiant Barriers

Radiant barriers, designed for use in Base-X 305 medium soft shelters, double the R-value (thermal resistance) of the tent. Marines use radiant barriers to keep cool air in and hot air out, reducing the number of environmental control units required in a combat environment.

5. Light Emitting Diode (LED) Lights

LED light sets for medium soft shelters and general purpose use are more efficient than traditional fluorescent lights. Marines light their tents with LEDs to keep power requirements at a minimum.

For more information about these and other expeditionary energy efforts underway, visit E2O's web site at www.hqmc.marines.mil/e2o.

commander, I actually had the advantage of being afloat with the Navy-going into Iraq at the same time. So I had a nice view of how it all comes together. I asked a lot of questions. How do I get the fuel off the ship? How do I get fuel to shore? How do I support combat operations? I've got the field experience and now work in an office that has ten really smart people who were hired to be innovative. And they come up with really cool ideas all the time. It's great to walk into a job where a bunch of smart people work for you and make great things happen. We're also getting



It's all about increasing the operational reach of the force and saving lives through fewer convoys on the battlefield.

great ideas out of a lot of other people who work in Marine Corps Systems Command, the Marine Corps Warfighting Laboratory, and elsewhere.

CURRENTS: What is the mission of the Expeditionary Energy Office (E2O)?

CALEY: It's all about increasing the operational reach of the force and saving lives through fewer convoys on the battle-field. The focus of our Experimental Forward Operating Base (ExFOB) program is to find the best ideas from business and adapt and adopt those technologies for use by our Marines. We work to get the right equipment, the best equipment industry has to offer, into the hands of our Marines.

Through the ExFOB program, we generate requirements that support the warfighter and help make the acquisition of the technologies to address those requirements go as quickly and as smoothly as possible. We partner with dozens of Marine Corps offices and the other services to make this happen.

CURRENTS: What are your top priorities for E2O?

CALEY: We look at our seven Marine Expeditionary Units and three Marine Expeditionary Brigades—the contingency response forces we put out there to support the joint warfighter. We focus on increasing the operational reach of those forces that are going to be put in harm's way. We also help the other forces that are training in garrison to get more readiness out of their training dollars. If you can make an artillery battalion 25 percent more fuel efficient, they can spend 25 percent more on the training that they need. I'm trying to get them 25 percent more opportunities and increased readiness in the process—more opportunities to fire their weapons, more time in the field.

We're focused now on two major programs—the ExFOB program, which I've already mentioned, and the Commander's Energy Readiness Program (CERP). Through CERP we will arm Marine Commanders with data on how much fuel they're using so that they can plan and make decisions that will extend their tactical

SPOUTIENT on the Marine Corps Expeditionary Energy Office

reach. Awareness is a big deal. The best example I can give you is about my father and his Prius. When I drive it, I drive it with an awareness of how much energy I'm burning. Why? Because the display in the dash shows me how much energy I'm using. If I don't have that awareness about my own vehicle, which I don't, I hit the speed limit while I'm still on the on ramp. I'm not paying attention to how much gas I'm burning. But when I drive my father's car, I pay attention. So what we're trying to do is provide that awareness to all of our Marines. Right now, they don't know how they're consuming their fuel.

The Medium Tactical Vehicle Replacement (MTVR) cargo/personnel transport can travel through tough terrain. The MTVR was designed to replace older, commercially based cargo trucks used by Seabees.

Photographer's Mate Airman Lamel J. Hinton

So we're trying to give our field commanders a better understanding of how they consume fuel so that they can employ it more efficiently.

CURRENTS: How do you provide that awareness to your Marines?

CALEY: We're conducting studies at the Integrated Training Exercises (ITX) out at Twenty-Nine Palms—predeployment exercises for every ground unit in the Marine Corps. So before you deploy, you do an ITX. During those exercises, we're studying behavior, watching what Marines do and how they do it. We're collecting data like how long our trucks are idling. At ITX 2-14 (held in February 2014), we saw trucks idling more than half the time—at zero miles per gallon, which gets you nothing. We saw generators running at less than 20 percent of their load—not powering anything. 80 percent of the power generated powers nothing.

We work to get the right equipment, the best equipment industry has to offer, into the hands of our Marines.

We're trying to make sure that commanders are aware of this behavior so they can do something about it. I assure you that, having been one of those commanders, no commander is out there trying to waste gas. They're trying to stretch it. They just don't always know where their energy is being used. If I don't have to tell them—if their own meters can tell them where their units are wasting energy—they'll take care of this problem before the Commandant of the Marine Corps (CMC) has to step in.

CURRENTS: This sounds like what's being done with the energy dashboard on Navy ships. Would you be putting something similar on Marine Corps vehicles?

CALEY: Well, the energy dashboard is the Ferrari. We're going into austere times, so I call what we're working on more of a motorized bicycle. I just want a gauge that lets the corporal know that he's getting one mile to the gallon based on the way he's driving his truck right now. So if he modifies the way he drives that seven-ton behemoth, he can get three, four or even five miles to the gallon. That's what we're trying to do.



CURRENTS: Are you working with your acquisition community to incorporate a gauge that displays fuel efficiency into the next generation of these trucks?

CALEY: That's right—a simple gauge. Some of these companies out there make smart dashboards for generators and for vehicles. But they cost a lot of money. The gauge that we are testing right now cost about \$100 per gauge. There's some labor costs associated with installing these gauges but it's significantly less than \$2,500 to modify the dashboards of our High Mobility Multipurpose Wheeled Vehicles (HMMWV) and other large trucks.

We're trying to give commanders enough information to make these changes. Part of that is materiel, and part of it is providing information that commanders need to compare their performance with "like" commanders—so they know how they are doing relative to their peers. Consider the following scenario. One infantry commander takes battalion A out and does mission X. A second infantry commander takes battalion B out to do mission X but does it with 40 percent less energy. We want to make sure that those two commanders know that. The commanders then will exchange Tactics, Techniques and Procedures (TTP) and you'll see a natural leveling down to

the better commanders out there. At ITX 2-14, a well-trained motor transport platoon outperformed other transport platoons that were not as energy aware. The well-trained platoons were nearly twice as energy efficient.

CURRENTS: Were they just more aware?

CALEY: They were more aware but they also had tighter procedures. They weren't sitting on the perimeter with their trucks idling for 40 minutes before they went out on convoy. The lieutenant was paying attention to all kinds of TTPs—the things we're trying to share across platoons and battalions.

CURRENTS: The Navy and Marine Corps focus on combat capability as a primary driver for energy investments. What insights can you share here?

CALEY: We're about combat effectiveness. Period. Commanders focusing on energy are focusing on the mission. That commander's job is to enable his force to do its mission for as long as possible with the resources it has. Right now, those commanders don't necessarily have the tools to do that. We're not trying to tell the commanders how to do their business. We're simply trying to give them the tools to make the best decisions possible. Then they can make their own decisions regarding the trade-offs

on the Marine Corps Expeditionary Energy Office



between the application of firepower and operational reach. They don't need help from anybody else to do that.

A destroyer commander does the same thing. A destroyer commander knows that when he's cruising across the Pacific, going against the current, doing 25 or 30 knots that he's going to be burning a lot of gas. But he also knows if he shifts 25 miles to the south, he's going with the current and can cruise and not burn as much gas. We're giving those Marine Corps commanders the type of information they need to make those types of informed decisions.

CURRENTS: What reflections can you share about the Secretary of the Navy's (SECNAV) energy training event held at Camp Pendleton earlier this year?

CALEY: The SECNAV's energy training event was a great thing and it had some unexpected positive results. For the Camp Pendleton event, we asked ASN (E,I&E) McGinn to carry the messages from the Commandant and the SECNAV to the Fleet. Frankly, ASN (E,I&E) McGinn's participation was essential in the event, because it demonstrated that SECNAV and CMC are serious about reaching our energy goals—expanding our operational reach, getting the most out of the fuel that we have. It was a great opportunity because we were able to focus on Marine Corps

leaders, battalion commanders, regimental commanders, and general officers and bring them all up to speed on the challenges ahead of us. And they provided some great ideas. For example, Brigadier General Mundy suggested incorporating a way to evaluate energy efficiency as part of the Marine Corps combat readiness evaluation system. I think that's a great idea. The Navy already has it as part of their Battle E awards. (Note: Battle E refers to the Navy's "Battle Effectiveness" award, an annual competition that recognizes superior performance—including energy efficiency—in training and operations). We got some other great ideas and input from the Fleet at the event. We were also able to share some of our own information and insights with the Marines and Sailors in attendance.

Getting feedback from those Marines out there is more important than I can possibly communicate. We're trying to identify their good ideas because they know how to implement those ideas in the Fleet. Frankly, I'm betting that their good ideas are better than mine. The young Marine out there driving the truck every day knows better than I do how to make that thing work and how to save energy along the way. Or that battalion commander out there—if somebody makes him aware of the issues we're facing, he knows a whole lot faster than I do what improvements need to be made to help us save energy.

Spotnight on the Marine Corps Expeditionary Energy Office

When I took over this program last summer, this program had a history of some great innovation. I want to make sure we're tapping great innovations from the Fleet as much as we can. The Marine Corps has a long history of innovation. For example, Marines were the first to practice and perfect the tactical innovation of close air support—using aircraft to support ground troops—during the "Banana Wars" of the 1920s. The Marine Corps and

CURRENTS: Is innovation easy in the Marine Corps?

CALEY: No, it's not easy. In fact, it's really hard. We're an organization that's based on tradition. Tradition is in natural opposition to innovation. We're also a victim of our own success. In the last 12 years, we have been heavily involved in two wars and combat operations and have been highly successful. Every unit that goes forward, even if they take significant

Just because we're successful doesn't mean we're as successful as we can be.

Navy team perfected amphibious operations during the inter-war period. And then we incorporated the helicopter into our operations so that by 1951, we could insert an entire battalion into a combat situation. That's the same Marine Corps that put together the Expeditionary Energy Office to help us to drive innovation and operational energy for the Marine Corps. The Marine Corps has been great at innovation for a long time. Now we're trying to encourage innovation from the Lance Corporal on up.

casualties, they're still successful. They still figure out how to make it work. One of the lessons that we teach in combat operations is just because you survived yesterday doesn't mean you got it right. But we often start believing that we're getting it right. And success can put a damper on innovation. I think that's part of the reason that the Commandant directed us to stand up this office. Just because we're successful doesn't mean we're as successful as we can be.

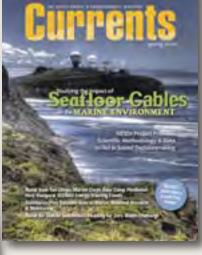
CURRENTS: So if you think you're successful, then there's no need to innovate.

For More Information

FOR MORE INSIGHTS into the SECNAV energy training events held on the west coast earlier this year, read our article entitled "Naval Base San Diego, Marine Corps Base Camp Pendleton Host Inaugural SECNAV Energy Training Events: ASN (EI&E) McGinn Delivers Keynotes; Hundreds of Sailors & Marines Share Energy Efficient Ideas & Best Practices" in the spring 2014 issue of *Currents*. To subscribe

to the magazine or browse the Currents archives, visit the Department of the Navy's Energy, Environment and Climate Change web site at http://greenfleet.dodlive.mil/currents-magazine.





Spothgrton the Marine Corps Expeditionary Energy Office

CALEY: You've got it right already. You've got 100 percent on the test so you're good to go. Our success today may just be good luck. I don't really think so. The past 12 years of success in combat shows that we're pretty darn good at what we do. My point is that we can

do better. The original focus of this office was improving our combat operations in Afghanistan. The technologies we fielded reduced Marines' need for fuel in one of the most dangerous areas of Afghanistan—the north end of the Sangin Valley. Fewer fuel convoys on the road translates to fewer Marine casualties. Now, we're just continuing to push innovation.

CURRENTS: And how do you push the innovations you've already developed? How do you get people to use them?

CALEY: Our ExFOB program and the SECNAV's energy training events are making

sure that our Marines know these systems are available for their use. The Marine Corps has a really high turnover rate (about 20 to 30 percent a year). So there's a continuous requirement for this type of training. One of the focus areas for both the CERP and the SECNAV's energy training events is to make sure that we teach Marines about the technologies that are available to them so that they get used.

CURRENTS: At the SECNAV training event at Camp Pendleton, you mentioned a process by which the Marines can communicate their requirements up the chain of command. Can you talk a little more about that process?

CALEY: Sure. There are two processes where Marines in the field can pass ideas for change up the chain of command. The first thing they can do is submit an urgent need statement that says, "We need a piece of gear to help solve this particular problem." The other thing that they can do is submit a "lessons learned" into the Marine Corps Center for Lessons Learned. Marines can say "We need to get gear X and Y into the field—for our deploying

reconnaissance or communications Marines—to make them more successful and so we don't have to resupply them as often." Frankly, if we teach them to work that way in the field, they'll work that way in combat. They train the way they fight.



Attendees at the MCB Camp Pendleton event received training on two of the POR energy systems that have been fielded to the Fleet including GREENS and SPACES.

CURRENTS: Congratulations on your office being rated as one of the world's top 10 most innovative companies in energy along with Tesla Motors, General Electric, and others. (Note: For more information about E2O's designation as a top energy innovator, visit www. fastcompany.com/most-innovative-companies/2014/industry/energy.)

CALEY: Thanks. Let me make a point about that. I talked about my office but our ability to innovate involves a lot more people outside of this office. The Marine Corps Systems Command has a full team that helps us focus on energy and acquisition. The Combat Development and Integration folks help us integrate our technologies into our field operations. Personnel from the Fire, Maneuver and Integration Division (FMID) help us drive what we're doing with our Marine Austere Patrolling System (MAPS). (Note: MAPS is a wearable system that contains a flexible solar panel which Marines can now use to power their gear and filter their water, without multiple batteries, reducing the average infantryman's pack weight by nearly 50 pounds.) In addition, the Logistics Integration Division



It's advantageous to both the Navy and the Marine Corps to make changes at the same time to our common fleets of equipment. Only then can we capitalize on economies of scale gained by things like the MTVR upgrade.

(LID) is leading development of a new Marine Corps requirement for hybrid power systems. E2O may have received the recognition as an energy innovator but there are a lot of other offices outside of E2O who help us make this work.

The Marine Corps is currently replacing old tactical quiet generators with the next generation of efficient generators called Advanced Medium Mobile Power Sources (AMMPS). Instead of running at 100 percent all of the time, AMMPS detects how much energy is needed at any given time then runs at the required level. There is also important work being done today on the Marine Corps' Amphibious Combat Vehicle (ACV). A working group is focused on making the ACV more energy efficient, so that it gets more operational reach. All these entities work together. It's Marine Corps-wide innovation. We here at E2O are able to focus those innovations all in one place.

The CMC recently released Expeditionary Force 21 (EF21), which talks about how the Marine Corps of the future is

going to fight. At E2O, we have had and continue to have the opportunity to help develop concepts in EF21 that will increase the operational reach of the force. It's a very innovative organization as a whole. The fact that the CMC established our office should tell you that he saw the requirement to have an innovative niche in energy where we could focus our effort—much like we do in some of these other areas.

CURRENTS: Are there any areas in which E2O has collaborated with other Navy commands on energy initiatives?

CALEY: Yes. We work with a number of our Navy partners including the Naval Surface Warfare Centers in Carderock, MD and Panama City, FL as well as the Engineering and Expeditionary Warfare Center (EXWC) in Port Hueneme, CA. These people are essential to our success. EXWC personnel work at Twenty-Nine Palms, Camp Pendleton and elsewhere to ensure that each and every ExFOB is well executed.

Carderock is another great example of our partnering with the Navy. Carderock is, for lack of a better term,

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GREENS, one of five PORs for renewable energy systems, is a 300-watt photovoltaic battery system developed by ONR that can provide continuous power to Marines in the field.

John F. Williams

It's Marine Corps-wide innovation. We here at E2O are able to focus those innovations all in one place.

our engineering pool. When we pick new technologies—technologies that look like they'll be beneficial to Marines—we need the right engineers to tell us how to evaluate those technologies and if it makes sense to procure and deploy them. This way we can be sure that we'll have the right piece of gear performing to the right standards and meeting the right requirements for the Marines. Carderock not only provides us with a whole team of engineers that help us accomplish this but they also reach out to the other warfighting laboratories—whether it's in Panama City or elsewhere—to ensure we have the right specialist on the team.

Marines and the Navy's expeditionary forces (Seabees, SEALs and others) share similar energy and water requirements. It follows that E2O and the Naval Facilities Engineering Command's Expeditionary Program Office work closely to improve the capabilities of expeditionary energy and water systems and field this equipment to Marines and Sailors.

The Office of Naval Research (ONR) is another great example of our collaborations with the Navy. One of the

larger programs that we're working on is our fuel-efficient Medium Tactical Vehicle Replacement (MTVR). The fuel-efficient MTVR is an ONR program that takes existing technologies and integrates them into the MTVR to make it between 25 and 41 percent more efficient. An artillery battalion has a whole bunch of MTVRs. If you make this one truck—the most ubiquitous truck on the Marine Corps battlefield—25 percent more efficient, you're effectively increasing the operational reach of all those units by 25 percent. That means the potential to prosecute 25 percent more targets, 25 percent more availability of fires. What ONR did was reach out, grab all the available technologies, and develop an engineering modification to this truck so that it requires less fuel to operate—making the most common truck in the Marine Corps more fuel efficient.

CURRENTS: Is the MTVR your heaviest hitter in terms of energy consumption?

CALEY: The MTVR is our largest fleet of trucks although the M1 Abrams tank is a larger energy consumer than any other combat vehicle on the battlefield. Any aviation asset

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LEFT: Colonel Thomas Eipp (right) presents the colors of Combat Logistics Regiment 1, 1st Marine Logistics Group, to Colonel James Caley aboard Camp Pendleton.

Cpl. Khoa Pelczar

BELOW: Seabee Equipment Operators drive an MTVR through the Naval Construction Training Center training course.

Chief Photographer's Mate Chris Desmond

obviously burns a lot of fuel as well. But the MTVR is our most common truck. It's in every unit on the battlefield. HMMWVs are also in every unit on the battlefield, and the Army and the Marine Corps together are working on an energy-efficient replacement for the Humvee—the Joint Light Tactical Vehicle. The MTVR is going to be in the Marine Corps and Navy inventory until 2034 so making it more efficient will provide great benefit to the Marine Corps and the Navy for decades to come.

CURRENTS: Who else do you collaborate with?

CALEY: We also work right across the hallway with Admiral Slates and his entire crew at OPNAV N45. It's advantageous to both the Navy and Marine Corps to make changes at the same time to our common fleets of equipment. Only then can we capitalize on economies of scale gained by things like the MTVR upgrade.

I think the Marine Corps has over 7,000 MTVRs in its fleet. The Navy may have around 1,500 MTVRs in its fleet. If the Marine Corps or the Navy were to make a change independently of one another, it would be much more expensive per copy. If we move together, it will be much less expensive per copy for all of us—and our entire force (including the SEABEES who deploy with us) will have extended its operational reach. It's all about making the whole team better.

Part of my job is to support the SECNAV's energy goals. One way I do this is by teaching at the Naval Postgraduate School's energy innovation course for senior Navy and Marine Corps leaders. It's a great opportunity because I get to see a lot of admirals, general officers, and members of the Senior Executive Service who have great impact across

the entire naval force. Along with my counterpart at OPNAV N45 (formerly CAPT Jim Goudreau and now his replacement, CAPT Jeffrey Maclay), we coordinate our message at this course and our underlying efforts because OPNAV N45 has the same operational focus that we do. So we need to capitalize on what we're doing together to solve our common challenges. Right now, we're figuring out how the brigade and the Expeditionary Strike Group (associated with the brigade) can operate more effectively together. It's not about the Marine Expeditionary Brigade (MEB) in a vacuum. It's about the MEB, the Expeditionary Strike Group, and how we as a force are successful in prosecuting our targets and destroying our enemies. So we are working with OPNAV N45 to address those challenges.

CURRENTS: What else would you like *Currents* readers to know?

CALEY: While we buy the armor, firepower and speed that we need to protect our Marines, we also need to give them the operational reach that they need to accomplish their mission. We're about extending operational reach and getting more out of every gallon of fuel. The final message I have—and we have talked to Congressmen about this—is we don't do "green." We're not encouraging Marines to be smart about their energy use because it's good for the environment. We're focused on energy efficiency because it increases Marine Corps readiness and improves the combat capability of the joint warfighter.

Diverting Food Waste from Landfills Saves Money & the Environment

NESDI Project Includes New Guidance Document for Navy Solid Waste Managers

HAVE YOU EVER wondered what happens to the leftover food in Navy galleys and commissaries? Unfortunately, most of it ends up at a costly landfill where it takes up space, rots, adds to area vermin and foul odors, and can pose environmental challenges. In fact, food waste takes up more space in landfills than paper or plastic.

According to the U.S. Environmental Protection Agency, this decomposing food waste emits methane, a potent greenhouse gas with 21 times the global warming potential of carbon dioxide.

Fortunately, the Naval Facilities Engineering and Expeditionary Warfare Center (NAVFAC EXWC) is working hard to solve

Food waste takes up more space in landfills than paper or plastic.



Why Divert Food Waste?

In response to Executive Order (EO) 13514, "Federal Leadership in Environmental, Energy, and Economic Performance," the Department of Defense (DoD) has established the goal of diverting 50 percent of its solid waste by FY 2015. Most of the Navy already recycles its solid wastes, but about 16 to 20 percent of the waste stream at Navy installations is food scraps (uneaten food and food-preparation waste), and those numbers jump to 25 to 30 percent when food-contaminated compostable wastes (such as paper plates, towels, napkins, and cardboard boxes) are included. Since 2005, the Navy's solid waste diversion rate has averaged between 32 and 42 percent. Diverting organic waste can increase this rate by another 10 to 15 percent, which would meet or even exceed the goal.

By increasing its diversion rate to 50 percent, the Navy will:

- Comply with EO 13514 and DoD's non-hazardous solid waste diversion goals
- Address environmental issues associated with food waste in landfills for surrounding communities (odors, flies/vermin infestations, increase in greenhouse gas emissions)
- Avoid paying solid waste disposal fees
- Reduce fuel consumption associated with transporting waste to landfills
- Help prolong the availability of space at the local landfills for nondivertible wastes, lessening the burden for local cities to establish new landfills

Reduce procurement costs by composting or biodigesting food waste and using the resulting organic matter as fertilizer, or by reusing otherwise unusable wastes, such as leftover cooking oil as an alternative to diesel fuel in generators. bin systems for pulling food out of the waste stream, composting, and dehydrating. Some technologies and methods have a large footprint and operating costs; others take up little space and are inexpensive. The following are the pros and cons of a few examples of waste minimization.

Waste-processing technologies may be appropriate at some installations, but at most installations a simpler approach may work best.

-Jill Hamilton

Techniques that Reduce, Pull Out, or Process Food Waste

There are three broad approaches to minimizing food waste:

- 1. Reduce the amount of food waste generated
- 2. Separate food waste from the solid waste stream
- Process food waste into a usable by-product, such as compost for agriculture or liquid effluent for irrigation

Because installations have different needs and capabilities, the goal of NESDI's Improving Non-Hazardous Solid Waste Diversion project (#478) is to find the most effective ways for each Navy installation to minimize the amount of food waste diverted to landfills. According to Jill Hamilton, an environmental engineer at NAVFAC EXWC in Port Hueneme, CA, and the Principal Investigator on this NESDI project, "waste-processing technologies may be appropriate at some installations, but at most installations a simpler approach may work best." Simple yet effective methods include color-coded

Source Reduction

Management practices for source reduction, such as tray-less dining, can save money and cleaning time. Also, decreasing portion sizes served in installation galleys and implementing programs that display "Taste Don't Waste" or "Take Only What You Can Eat" signs, like the ones used in Naval Air Station (NAS) Jacksonville's galley, can mean fewer scraps and less money spent on food that is not consumed. Source reduction, however, requires upfront planning, and data collection and can be labor-intensive.

Separation

Using simple approaches like low-cost bin systems or collection containers to separate the kitchen, cafeteria, and commissary waste can lower disposal costs because less waste will go to the landfill. Food waste separation can easily increase the rate of landfill diversion and result in immediate savings. However, food waste separation is a non-starter if processing technologies (such as compost methods, dehydrators, and decomposters) are not available or have not been set in place. Collection of post-consumer



compostable and food waste may require additional handling or disposal in a landfill because of contamination.

Waste Processing

Once the waste is separated, Navy installations wanting to divert it from landfills will need an outlet if there is no on-base option. Below are a few systems that can help.

Anaerobic Digester

An anaerobic digester can break down sewage sludge and generate methane gas, which in turn can be used to generate electricity. Studies show that combining sewage sludge and food waste enhances the performance of anaerobic digesters so more methane gas can be harvested, and remaining byproducts can be used as soil amendment.

Composting Techniques
 Composting techniques include the in-vessel composter, a temperature

and moisture-controlled system that can accommodate meat and grease and provide a consistent sanitized product without taking up much space (although it has a high capital cost); vermicomposting, which uses red worms to speed up the degradation process by eating the food waste (although worms are not always a welcome addition to kitchen areas); the windrow, which generates a large volume of compost and accommodates meat and grease but requires frequent turning, a large open space, and three to six months for processing; and the aerated static pile, which can also process a high volume of compost but has high capital and energy costs.

Liquefying Decomposter

A liquefying decomposter, which can be found in Marine Corps Air Ground Combat Center (MCAGCC) Twenty-Nine Palms' mess hall,

quickly breaks down food waste into a nutrient-rich liquid effluent that can be discharged into the sewer or be used in irrigation. At wastewater treatment plants, it can enhance anaerobic digesters' methane production, and in the fields it can fertilize the crops. The cons are that it processes a limited amount of waste and requires a large amount of water.

Dehydrator

The dehydrator heats food waste at 180 degrees Fahrenheit or greater, and quickly produces reusable products in sterile biosolids and condensate. In addition to reducing waste volume as much as 90 percent, benefits include one-person operation, no water connection requirement, and no addition of microorganisms. During a pilot test run by the Defense Commissary Agency (DeCA) from August through

September 2012, two 250-pound dehydrators reduced commissary food waste weight at MCAGCC Twenty-Nine Palms by 86 to 90 percent. Based on this, DeCA estimated that it could go from three dumpsters picked up three times a week to one dumpster picked up weekly at that location. Most dehydrators can process the food in 15 to 24 hours. But because no additional food can be placed in the machine during the cycle time, often two machines are purchased to allow for one to be filled while the other is in operation.

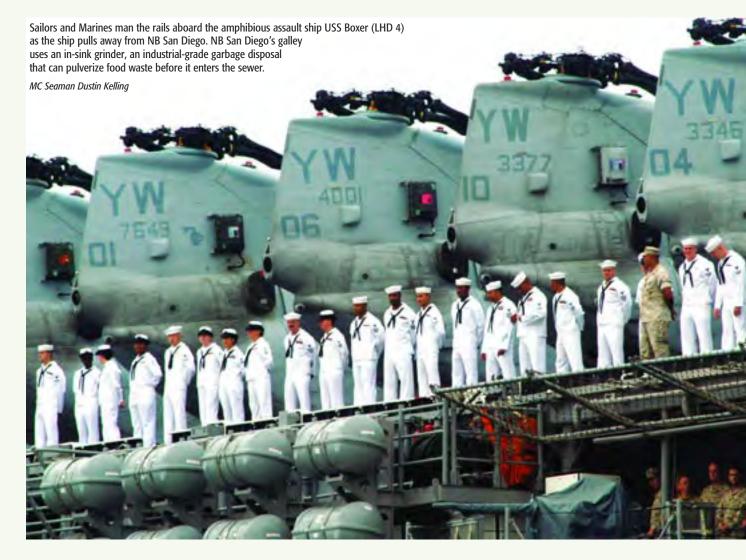
In-Sink Grinder

Naval Base (NB) San Diego's galley uses an in-sink grinder, an industrial-grade garbage disposal that can pulverize food waste before it enters the sewer. The ground-up waste can easily enter wastewater treatment plants without clogging the pipes. And because NB San Diego's galley does not produce much waste, only five percent of a 32-gallon container ends up as trash, comprising big bones and other items that cannot go in the grinder. Both the decomposter and the in-sink grinder send materials through the sewage system,

where the sludge may be made into compost.

Limitations

Using the best methods to collect and separate food and organics along with the most appropriate technologies to aid diversion, the Navy can decrease waste, recover its value, and achieve environmental compliance. Nonetheless, problems with using a new technology or practice can include cost, lack of physical space, behavior modification and the need for training. Understanding these limitations can help environmental program





managers choose the right methods and technologies for their installations.

To be successful, a food waste program must be economically sustainable. While food diversion can be done with minimal investment in research and development, if the infrastructure setup, equipment, and labor costs greatly outweigh the benefits at an installation, the program is not sustainable. For example, although DeCA has already successfully

although DeCA has already successfully used dehydrators at some of its commissaries, a similar program to collect all of the food waste at Marine Corps Base Camp Pendleton's 16 galleys would not be cost-effective. Studies showed that the total amount of food waste disposed would require at least 48 dehydrators.

At installations that choose to compost food waste, finding space can be another issue, according to Hamilton. Installations that choose a dehydrator or liquefier would need space either inside or immediately outside of the facility.

Educating kitchen workers on how to use new technologies and training consumers to separate waste into bins

rather than throwing it into one trash container can take time. While there is a learning curve and often a tendency to fall back into former ways of handling waste, this problem can be solved once everyone is trained. This has been shown at NAS Whidbey Island, where building managers continually train incoming Sailors through face-to-face interactions, e-mails, phone calls, and brochures. Furthermore, giving people reasons to implement these

Educating kitchen workers on how to use new technologies and training consumers to separate waste into bins rather than throwing it into one trash container can take time.

practices can motivate them to change their ways. For example, while at first tray-less dining may be considered cumbersome because diners must walk back and forth to get each part of their meal together, installation managers and Sailors will soon see that cleanup is easier (no trays to wash) and the installation spends less on detergent, water, and uneaten food.

Naval Air Station Whidbey Island Supports Successful Food Waste Reduction Program

While compiling the information to include in its guidance document, the NESDI project team visited NAS Whidbey Island. The facility has a strong reputation for food waste reduction, and has achieved a recycling rate of 75 percent or higher since 2007.

Working closely with its environmental department to coordinate and accommodate its ambitious sustainability plans, NAS Whidbey Island pulls food waste out of its commissary, galleys, food

courts, offices, youth centers, delis, snack bars, daycares—every place associated with the base that generates food waste-and works to compost cups, utensils, paper towels, and more. For NAS Whidbey Island, it is especially cost-effective to recycle and eliminate as much waste as possible. Since its own landfill closed, the nearest landfill is 300 miles away. This travel distance increases the tipping fee to \$150 per ton (compared to the average of \$30 per ton in most regions). According to John Lacy, solid waste program manager for the Naval Facilities Engineering Command (NAVFAC) Northwest, who helped start the program in 1996, annual reports on five major installations show that the net dollar benefit is \$55 per ton for recycling. "We look at total costs of doing business," Lacy says. "Our products are shipped to a transfer station and loaded onto a train that travels hundreds of miles to the nearest landfill. Everyone gets paid—collectors, transporters, railcar loaders, and shippers. But when we divert the material to on-base composting or salable material to the local loading dock, we

only pay one component of a total cost versus the landfill disposal costs. Diverting material through composting makes economic sense to us. And that defines the savings."

Waste at the base is separated into appropriate bins and placed curbside. Don Bird is NAS Whidbey Island Recycling's compost facility operator and equipment operator. He collects up to

compostable, and the building managers take care of it at weekly or daily staff meetings. We also present a slide show at the quarterly building managers' meetings. A lot of Sailors come and go, and as soon as they are trained a new batch of Sailors arrives. We use every outlet we can to get the word out—we must keep our rate up to keep solid waste costs down."

We are not running this program because it's fun. We are doing it because it costs less than solid waste disposal.

—John Lacy

3,000 pounds of post-consumer food waste from all 34 locations three times per week—this totals 7,500 to 9,000 pounds of food waste that is turned into compost every week. After testing the compost, NAS Whidbey Island uses as much compost as it can and sells the rest.

Making sure the food and food-contaminated wastes are separated correctly in the bin systems, however, can be a daily battle. Oliver "Rusty" Elam, manager at NAS Whidbey Island Recycling, says NAS Whidbey Island Recycling conducts many outreach functions to educate people and change habits. In addition, Elam says, "Each building has a manager who works with the people in the buildings, and we resolve issues as we go along." Elam adds, "Training people about which items can be composted, mostly through face-to-face communication, is crucial. They don't always realize they can compost things like pizza boxes that have cheese and grease on the bottom. We train them by taking the building manager to their trash bins and showing them what is

"We are not running this program because it's fun," Lacy says. "We are doing it because it costs less than solid waste disposal." NAS Whidbey Island's technologies include an onsite in-vessel composter that was built in 2000. While expensive, Lacy points out that it can handle organic materials better than technologies that make aerated static piles of compost. "It's a quantum difference," Lacy says. "This is what allowed Whidbey to go above the 50 percent diversion mark. It's hard to go above 50 percent without organics recycling."

Another key component at NAVFAC Northwest, Lacy says, is the collection and processing of post-industrial wood waste and providing the wood chips that comprise the bulking agent for the food waste compost. "Last year our equipment processed 2,004 tons of wood waste, which helped us produce almost 700 tons of compost because the moisture cooks off. That is significant. Wood is a big part of the waste stream at all our installations, more than in the traditional municipal sector."



Chief Quartermaster Jack Wymer drills a hole in a synthetic bone used for training in NMCSD's Bioskills Training Center which provides courses in advanced surgical skills, courses to enhance and hone existing skills. The facility's galley diverts 3.6 tons per week in food waste from the San Diego landfill, which extends the life of the landfill by 53 days per year. MC1 Anastasia Puscian

In addition to using bio-bags to keep its 20 galley bins clean, NAS Whidbey Island now uses onboard pressure washers on the food-waste collecting trucks to clean out the bins. The water used is then dumped into the mixer area of the truck. This helps deter rats and other vermin from the scullery area. "The theory here," Elam says, "is that when we dump the containers, if we can use pressure washers to clean them out, we will stop using bio-bags and have even more solid waste source reduction."

"Whidbey Island composting has worked really hard to keep labor costs down," Elam says. "It's the most cost-effective program—we run the whole thing with two people (Bird plus one laborer) and are conscious of what we do. We also mix paper with our food waste so it gets composted instead of thrown away. Almost nothing is wasted."

Having the ability to compost also allows NAS Whidbey Island to make full use of hardcopy books. "We remove the binding with a specialized saw," Lacy says. "The result is two products: the high-quality paper, which we can sell as baled recycled paper, and the binding, which goes into and becomes part of the compost."

What's next for NAVFAC Northwest? Lacy believes a 90 percent diversion rate can be achieved, but "getting that last 10 to 12 percent requires a huge education and outreach project—we are really talking about people changing their habits. We all have challenges with that. Changing habits is not easy for anyone."

Navy Region Southwest Launches Hospital Galley Food Diversion Program

Another program surveyed for the new NESDI guidance document was the award-winning Sustainable Solid Waste Program (SSWP) at Navy Region Southwest (NRSW). For over 25 years, this program has diverted construction materials, cardboard, food waste, and cooking oil, on top of the traditional paper, plastic, and metal. Some installations even make money by treating solid waste as a commodity instead of spending money to put it into landfills. Galleys at NB San Diego, such as Naval Medical Center San Diego (NMCSD), also known as Balboa Hospital, separate food from the waste stream for composting at the Greenery, the portion of the Miramar

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landfill that has space set aside strictly for food waste. Culinary Specialist First Class Terrell Downs, the leading petty officer at NMCSD's Nutrition Management Department, says that Balboa's galley program "is saving the hospital a lot of money in disposal costs and helping the environment. We do 3.6 tons per week in food waste, which extends the life of the San Diego landfill by 53 days per year."

To set up Balboa Hospital's program, Jose Amuchastegui, the regional solid waste manager for the NRSW SSWP, conducted research on food waste, working closely with the food-service locations and staff. "Starting a food waste program takes a lot of effort and commitment from the folks in the kitchen," Amuchastegui says. "Fortunately, the Balboa galley was looking to increase diversion of food waste. My research found potential places and led these people to start composting food." These include the galley managers (Navy officers and Sailors) and the kitchen staff (civilian contractors). Amuchastegui then coordinated with the City of San Diego's Environmental Services Department, which owns the local Miramar landfill. Because participants in this program must meet certain
City requirements, Amuchastegui
acted as the link between the hospital
and the City and made sure all the
requirements were met.

bin marking and contamination avoidance. Downs says that while training all 75 full-time galley employees took a few months, "everything is going very smoothly now."

Starting a food waste program takes a lot of effort and commitment from the folks in the kitchen.

-Jose Amuchastegui

Amuchastegui and his staff then bought and strategically placed the appropriate bins inside the kitchen and common areas—one for food waste, one for mixed recyclables, and one for general trash—and labeled them accordingly. They placed special containers outside of the kitchen for general trash and food waste. The food waste container must be locked at all times to prevent contamination from non-food items because Miramar Greenery will only accept 10 percent contamination. (Anything with more than 10 percent is offloaded to the trash.) The City then inspected the kitchen and the bins and took photos, which it used to create and present a 30-minute, individualized briefing to train workers on

Amuchastegui's research helped make even more positive changes. He discovered that Balboa Hospital's current contracted hauler needed to refurbish its 30-to-45-cubic-yard container, which had been used as a compactor for all the trash, including food. The compactor was being serviced three times per week, but Amuchastegui managed to modify the contract to reduce servicing to twice a week and added a smaller (6-cubicyard) container for general trash, thereby using the compactor solely for food waste. Amuchastegui says that "subtracting the extra day of service created enough of a cost savings to add the six cubic yards. And we will keep the 30-to-45 cubic yard container, but for food waste only."







SEAL candidates participate in Surf Passage at NAB Coronado—one of many physically demanding evolutions that are a part of the first phase of SEAL training. Navy SEALs are the maritime component of U.S. Special Forces and are trained to conduct a variety of operations from the sea, air and land. The base was the site of a NRSW food waste pilot program.

MC1 Michael Russell

Behavior modification at the galley, Amuchastegui says, can be a challenge. At Balboa, the Sailors managing the galley recently modified the contract to require kitchen staff to segregate the food waste, but "since there is no mandate that you must recycle food waste," Amuchastegui adds, "people must be motivated. Here in the Navy we always struggle because there are always other priorities, so if you don't have it in you to use a blue container versus a black or a gray container, you may just throw it into the first available container. It's challenging to change people's minds, but that is what we are here for. We do training and marketing so people know the Navy has a recycling program. We try to be at every recycling event on base. We set up booths with promotional items and brochures and answer questions and promote it, to affect a culture change throughout the Navy. We also have open houses, where we encourage people to visit and show them around the recycling yards so they can see and understand what we do."

Amuchastegui also was the recycling coordinator for Naval Amphibious Base (NAB) Coronado, which was the pilot for a food waste program. "We had everything prepared to start that program," he says, "but ran into a problem at the end" relating to the cost of transporting the food waste from the NAB Coronado galley to the Miramar landfill. Because NAVFAC transportation personnel had no place to clean the special food waste containers (to prevent residue and odor), Amuchastegui found a local contractor to haul the refuse and service the bins. But as soon as he submitted the contract modification to cover this extra cost, the federal government sequestration banned all contract modifications. Having a compactor pick up and service a 30to-45-cubic-yard container would cost \$100 per trip to the landfill, whereas having a small 6-cubic-yard container serviced costs \$67 each time. "That is a huge savings," Amuchastegui says. "But because there was no compactor for the NAB Coronado galley, I could

not use the formula I used at Balboa, and it was not cost effective. To start segregating the food waste, we'll need to add another container, which is extra money, and it's hard to get extra money these days."

"Projects will not go far without commitment from the galley or dining facility staff," says Amuchastegui. "The NESDI guidance document is a great tool to provide them so they know what to do. We will be the middlemen, making sure we coordinate and meet the proper requirements. A big priority is to minimize the amount of food that is being prepared, but that is up to the folks at the dining facilities. They are the ones who are making it happen. By not sending food waste to the landfill, we can extend the life of the landfill, which will benefit the Navy."

The SSWP has a presence on Facebook at www.facebook.com/SSWProgram, and on the web at www.cnic.navy.mil/regions/cnrsw/om/environmental_support/recycling.html.

How Installations Can Start Diverting Food Waste: The New NESDI Guidance Document

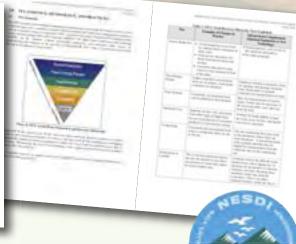
To help other Navy installations get started in food diversion, the NESDI guidance document, "Improving Non-Hazardous Solid Waste Diversion," describes how a typical installation can find the correct tools for handling food waste at each site. The information included in the guidance is based on site visits to NAS Whidbey Island and University of California, Davis, along with interviews with 16 other DoD and private sector food service facilities. The guidance features a matrix to identify installations where food diversion would be beneficial. Factors to consider include:

- Economic feasibility
- Where the food waste will be processed (on or off-site)
- Amounts and quantity of feedstocks (waste types) available
- Goals/scope of the program
- Permitting requirements
- Simplicity and convenience for users

Approximately 15 percent of Navy installations that generate one or more tons of solid waste per day participate in composting, primarily green or landscaping waste. Of these, only two or three incorporate food waste. With the NESDI guidance document, NAVFAC EXWC expects at least half of the installations that currently compost to begin incorporating food diversion into their operations.

After consolidating the information on current and emerging techniques used for separating food from





organics, green waste, and recyclables, the guidance document will identify applicable techniques to individual candidate sites to help facilitate future implementations. Eventually, increasing implementations will support integration of relevant best management practices and technologies throughout the DoD and make food waste separation and diversion a standard requirement.

program should be
easier and more costeffective than starting a
new composting program,
NAVFAC EXWC will work to convince
existing Navy composting programs
to include food separation/diversion
in their program.

To get a copy of the NESDI guidance document, you can visit the NAVFAC EXWC Environmental Technical

NAVFAC EXWC expects at least half of the installations that currently compost to begin incorporating food diversion into their operations.

Phase II of this NESDI project—pending funding—will identify appropriate Navy installations to set up a demonstration. This will involve identification of practices and/or technologies, the potential acquisition of equipment, training, logging of diverted food on a biweekly basis, and determination of the best end point for diverted food. The demonstration(s) will be fully documented and a final report will be written.

At the conclusion of the project, NAVFAC EXWC will revise the Navy's Integrated Solid Waste Management Plan guidance to address food waste diversion. Because adding food separation to an existing composting Publications web site at:
www.navfac.navy.mil/navfac_
worldwide/specialty_centers/exwc/
products_and_services/ev/
ev-pubs.html. The document name is
Improving Non-Hazardous Solid Waste
Diversion, Food Waste (NESDI #478)
and the document number is UGNAVFAC-EXWC-EV-1403. You can
also contact Jill Hamilton at the information provided below for a copy.

CONTACT

Jill Hamilton Naval Facilities Engineering and Expeditionary Warfare Center 805-982-4892 DSN: 551-4892 jill.hamilton@navy.mil

Spent Grease & Bones

Food Waste Segregation Has Evolved a Bit Since the 1950's

FOOD WASTE SEGREGATION (if not diversion) was alive and well at this Army base during the end of the

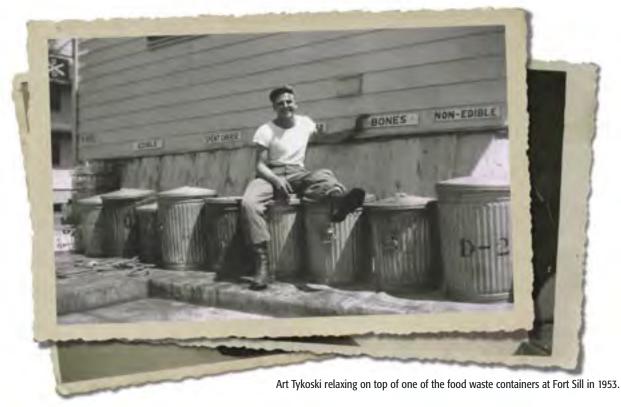
this Army base during the end of the Korean War.

Cindy Webber, a chemist at the Naval Air Warfare Center—Weapons Division China Lake, California and a member of the Navy Environmental Sustainability Development to Integration (NESDI) program's management team—the Technology Development Working Group (TDWG)—happened upon this photo of her brother, Art Tykoski, while going through some

old family photographs. This photo was taken of Art at Fort Sill (an army base in Oklahoma) in 1953 during his basic training.

Coincidentally, Cindy had just reviewed Jill Hamilton's recently released food waste diversion guidance (Improving Non-Hazardous Solid Waste Diversion, Food Waste (NESDI #478), document number UG-NAVFAC-EXWC-EV-1403) and forwarded this photo to *Currents* Managing Editor, Bruce McCaffrey, just as he was editing an article

about Jill's work for this issue of the magazine. (Bruce is also a member of the TDWG.) Though Art was enthusiastic about the Army's early efforts, food waste diversion has come a long way since then. For more insights into 21st century solutions to food waste, read our article entitled "Diverting Food Waste from Landfills Saves Money & the Environment: NESDI Project Includes New Guidance Document for Navy Solid Waste Managers" on page 54 in this issue of *Currents*. \$\mathcal{L}\$



First East Coast Fleet Energy Training Event Focuses on Energy Awareness

ASN (E,I&E) McGinn & Other Senior Officials Stress the Role of the Fleet in Uncovering Sound Energy Conservation Practices

U.S. FLEET FORCES Command (USFF) hosted the first east coast Fleet Energy Training Event for type commanders and their operational unit-level leaders aboard Naval Station Norfolk on March 25, 2014. The forum was intended to increase awareness of current energy initiatives and evaluate future options that will enable the Navy to achieve energy

efficiency and reduce energy consumption throughout the Fleet. Roughly 400 participants—a mix of senior leaders, operators, and civilian professionals—explored solutions to energy challenges with a focus on increasing range, endurance, and combat effectiveness.

Mr. Jim George, program manager, Combat Logistics Force Ships, received the award on behalf of Robert E. Peary.

USNS Grapple's crew oversaw repairs to the ship's air conditioning units and replaced the condensers to ensure proper efficiency. They also provided oversight on the



Ship Recipients of SECNAV Energy Awards

To kick off the event, Assistant Secretary of the Navy (Energy, Installations and Environment) (ASN (E,I&E)) Dennis McGinn presented Secretary of the Navy (SECNAV) Energy Awards to six ships. In the Military Sealift Command category, USNS Robert E. Peary (T-AKE 5) and USNS Grapple (T-ARS 53) were recognized for their outstanding energy conservation accomplishments.

USNS Robert E. Peary's crew instituted energy saving initiatives to include installation of adjustable speed drives on pump systems and the establishment of procedures that identified plant configurations combined with speed curves that minimize generator hours and maximize efficiency.











overhaul of the controllable pitch propeller system and bow thruster repairs and provided guidance on load share and timing for the engine control system—making for a more efficient plant. Mr. Edward Shanley, assistant supervisory project engineer, Rescue and Salvage Ships, received the award on behalf of Grapple and her crew.

In the small ship category, USS Nicholas (FFG 47) was recognized as a "platinum" award winner. Recently decommissioned, Nicholas supported the Command's commitment to energy conservation through the use of Shipboard Energy Conservation Assist Team charts and transit speed curves with optimal plant alignments and routine training and conservation awareness.

Nicholas' conservation efforts saved 7,800 barrels of fuel with a cost equivalence of 1.1 million dollars. CDR Corey Blazer, the last commanding officer of Nicholas, accepted this award.

USS Roosevelt (DDG 80) and USS Gravely (DDG 107) were recognized in the medium ship category. Roosevelt instituted standard operating procedures to ensure energy conservation was thoroughly considered in its daily routine and operations. By utilizing fuel curves and efficient plant lineups, Roosevelt saved 20,000 barrels of fuel with a cost equivalence of 2.7 million dollars. Rear Admiral Peter Gumataotao accepted the award on behalf of Roosevelt.

USS Gravely was awarded the SECNAV energy award at the gold level. Gravely's efforts saved 15,800 barrels of fuel with a cost equivalence of 2.2 million dollars. These savings were realized as a result of the crew's commitment to energy conservation and implementation of procedures that ensured the ship operated at high efficiency while maintaining operational readiness. Gravely's commanding officer CDR Kevin Kennedy

accepted the award on behalf of the ship and her crew.

USS Kearsarge (LHD 3) accepted the SECNAV award at the blue level in the large ship category. Kearsarge is committed to sound energy conservation practices from transiting at the best economic speed per fuel curves to using the optimum track ship routing tool. Kearsarge saved 13,700 barrels of fuel with a cost equivalence of

If you don't do everything you can in terms of saving energy, years from now you will find yourself with your back against the wall.

ASN (E,I&E) Dennis McGinn



1.9 million dollars. Kearsarge's commanding officer, CAPT Fredrick Nielson accepted the award.

All of these ships are based in Hampton Roads, with the exception of USS Roosevelt which is based at Naval Station Mayport.

Plenary Session

After the awards ceremony, senior officials reinforced why reducing energy consumption should continue to be a priority Navy-wide. Featured speakers at the plenary session included:

- ASN (E,I&E) Dennis McGinn
- Commander, USFF, Admiral Bill Gortney
- Director, Chief of Naval Operations Energy and Environmental Readiness Division (OPNAV N45), Rear Admiral Kevin Slates
- Commander, Naval Surface Force Atlantic, Rear Admiral Peter Gumataotao
- Deputy Chief of Staff for Fleet Installations and Environmental Readiness, USFF, Mr. Joseph Murphy.

Admiral Gortney was the first to take the stage to highlight the Navy's successes in reducing energy consumption and maintaining readiness in recent years as the cost of fuel has continued to rise. That means, as Admiral Gortney stated, "we need to get as much readiness as we can for the least cost so we can stay out in front of the cost of energy."

ASN (E,I&E) Dennis McGinn took Admiral Gortney's sentiments a step further, stating "if you don't do everything

you can in terms of saving energy, years from now you will find yourself with your back against the wall."

Mr. Joe Murphy explained that USFF has been actively working with the type commands to lead, measure, assess and correct energy initiatives as needed to meet the desired end state of maximum efficiency. He made the additional points that:

- We need to make the best best practices standard operating procedures where it makes sense to do so.
- Technology represents a small percentage of our long-term energy solution, so individual behavior will be paramount.

"We need to get beyond our old mindset and embrace culture change. Include energy in your planning factors—make it routine," said Mr. Murphy.

Mr. Murphy and USFF are already using the Readiness Kill Chain methodology, in which current processes, practices and decision making are evaluated to ensure best use of resources, to implement a comprehensive approach to energy use. A key principle of the Readiness Kill Chain is that all hands, from SECNAV to the deck plates in an engine room, have a key role in energy efficiency.

"Changing how we use our energy resources saves money in an increasingly austere fiscal environment," said Mr. Murphy. "It also yields tangible warfighting advantages by giving us longer legs, reducing refueling vulnerabilities, and providing an operational energy reserve in the event that circumstances require a burst of speed or a longer dwell time."





Other Training Events

IN FEBRUARY OF this year, similar energy training events were held in California for west coast and Marine Corps commands. For more information about these events, read our article entitled "Naval Base San Diego, Marine Corps Base Camp Pendleton Host Inaugural SECNAV Energy Training Events: ASN (EI&E) McGinn Delivers Keynotes; Hundreds of Sailors & Marines Share Energy Efficient Ideas & Best Practices" in the spring 2014 issue of *Currents*. To browse the *Currents* archive, visit the magazine's online home on the Department of the Navy's Energy, Environment and Climate Change web site at http://greenfleet.dodlive.mil/currents-magazine.



Rear Admiral Slates and other speakers at the event maintained that the Navy is not focused on energy due to a desire to be green or save money. "Increasing combat capability is the key driver for all of these initiatives," he said. Rear Admiral Slates expressed confidence that a combination of technology, best practices and ideas from the Fleet, and broad energy awareness across the Navy, will enable the operators to avoid "the wall" that Mr. McGinn spoke about and allow the Navy to remain a formidable, combat-ready force—while using energy wisely.

Rear Admiral Gumataotao agreed with Rear Admiral Slates when he said, "We need best practices, but for all of us it comes down to warfighting. Whatever we're doing for energy has to be transparent to the operator."

Representatives from the type commands, including the following individuals and organizations, then provided briefings on their progress toward optimizing energy use:

- LCDR Tom Brashear and CDR Chris Boyle, Commander, Naval Air Force Atlantic
- CAPT Don Neubert, Commander, Submarine Force Atlantic
- Mr. Sonjae Whang, Military Sealift Command
- CAPT Marc Delao, Naval Expeditionary Combat Command



The Navy is transitioning from a philosophy of "save energy if you can" to "save energy unless you can't."

Afternoon Breakout Sessions

In the afternoon, operators held breakout training sessions in the aviation, surface and submarine type commands, Military Sealift Command, and Naval Expeditionary Combat Command, as well as Naval Air Systems Command and Naval Sea Systems Command. These breakout sessions allowed participants to discuss methods for reducing energy consumption within their own organizations and documenting good ideas for further consideration.

MSC's breakout session consisted of a two-hour training course that focused on improving shipboard operating practices for better efficiency. During the training, participants (mostly chief engineers and maintenance officers) discussed approaches for evaluating their financial baseline to make energy saving decisions. Among the topics discussed were air compressors, engine cooling/reheating, and lighting and shore power, with an emphasis on both reduced consumption and lower costs.

Session participants agreed that more incentives and guidance are needed for ship engineers and maintenance staff to successfully implement these types of upgrades.

One of the key messages of this and other recent energy training events was that the Navy is transitioning from a philosophy of "save energy if you can" to "save energy unless you can't."

"Well-executed training events like this one help to identify the reforms that need to be made to the Navy's energy culture and address the SECNAV's specific energy goals," said Rear Admiral Slates. OPNAV N45 public affairs personnel conducted brief videotaped interviews with attendees throughout the day, and are using the interviews to develop online content to share ideas and feedback with those who didn't get the benefit of participating in the event in person.

To read quotes from participants in the Norfolk Fleet Energy Training Event, visit www.twitter.com/navalenergy or www.facebook.com/navalenergy. \$\ddot\$

CONTACTS

CDR Scott "Cliffy" Hemelstrand U.S. Fleet Forces Command 757-836-2672 DSN: 836-2672 scott.hemelstrand@navy.mil

Ted Brown U.S. Fleet Forces Command 757-836-4427 DSN: 836-4427 theodore.brown@navy.mil

DID YOU KNO?

How did I save energy for the Navy?

As a founding member of Naval Aviation Energy Conservation (Air ENCON), I helped implement energy-saving practices such as Short Cycle Mission and Recovery Tanking (SMART) across the fleet. Based on the current price of JP-5 jet fuel (around \$3.84 per gallon), the projected potential savings for Navy-wide implementation of SMART is approximately 10.5 million gallons of fuel and \$40.3 million dollars annually.

Name: CDR Daniel Orchard-Hays

Age: 40

Hometown: Virginia Beach, VA

IDE

Job: Operations Officer Command: Air Wing One



Do you think culture change, in regards to energy conservation, is important for our Navy?

Absolutely. Many of us grew up in a period of inexpensive energy and have become accustomed to leaving the lights on or driving our car often without regard to the cost of the energy used. As energy costs increase due to higher demand and more expensive extraction of these resources, our old habits need to adjust so we can reduce our energy consumption. Improving energy efficiency and reducing waste will allow us to allocate our resources to maximize our training and readiness in preparation for carrying out the nation's mission.

ENERGY SECURITY ENHANCES COMBAT CAPABILITY

Did you know that Naval aviation operates more than 3,700 aircraft that consume more than 600 million gallons of petroleum-based fuels each year?

As a Naval aviator, I've always found energy security to be a critical element for warfighting, particularly to the carrier aviator. Maintaining energy security allows the warfighter to execute the assigned mission with the full range of capabilities.

While assigned to Commander, Naval Air Force Atlantic, I participated in the Navy Task Force Energy Working Group on behalf of Commander, Naval Air Forces and Commander, Naval Air Forces-Atlantic to develop strategies to improve energy-saving practices and principles. While working with operational units, we codified the use of different F/A-18E/F tanker configurations, which resulted in reduced fuel usage without impacting our operational capability. In addition, we developed a plan that utilized alternate means for moving external armament equipment and stores during cross-country flights to reduce drag on the aircraft. This also resulted in

measurable fuel savings. Finally, we determined that more energy savings could be obtained by refueling aircrafts by truck instead of "hot pit" refueling. By reducing fuel waste through energy-saving practices such as these, not only are we able to use the saved fuel for additional training and readiness, but we are also able to reduce the logistical resupply for operationally deployed units.

As the Operations Officer for Carrier Air Wing One, I continue to seek out opportunities to identify and implement energy-saving practices, such as SMART tanking, across the naval aviation community.



Kenneth Hess CNO Energy and Environmental Readiness Division (Code N45) 2000 Navy Pentagon, Room 2E258 Washington, DC 20350-2000

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